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Vice President’s Letter

Education opens many paths, sometimes ones that are unexpected.

When Deanna Brown graduated from MSU’s College of Veterinary Medicine in 1990, she hoped to put her education to use in a practice specializing in dairy cattle. She did follow that path for a while, but today Lt. Col. Brown is helping train veterinarians in Iraq to better serve their country’s livestock producers. The story of her work in Iraq starts on page 22 of this issue of Landmarks.

Entomologists are usually thought of as individuals who use their education to help farmers and others manage insect pests. There are, however, entomologists who seek specialized training to grow insects. MSU has been providing such training for almost a decade, and there’s always a full house for the annual insect-rearing workshop. The story of the 2006 workshop is on page 14.

Helping young people discover the career paths available to them is one of the missions of the 4-H program. In 2007, 4-H will celebrate its centennial. The 4-H movement began in Holmes County in 1907 and has been helping young people explore their potential ever since. Upcoming issues of Landmarks will report on the 4-H centennial activities.

Production agriculture—the industry that produces our food and fiber—attracts some of this nation’s most outstanding men and women. Nowhere was that more evident than in Clay County recently. Earlier this year, Ralph Weems, Jr., one of Mississippi and the nation’s leading soybean producers, died. He left 600 acres of soybeans. In early October, his friends and neighbors organized to help the Weems family harvest the crop. Eight combines were able to get the beans harvested and ready to market in just a matter of hours. It was truly a community effort, with Bryan Foods in West Point providing lunch for the harvest crew.

The American farmer is a self-sufficient individual but also an individual who is selfless in service to others.

Students enrolled in the programs available in the Division of Agriculture, Forestry and Veterinary Medicine at MSU will follow many career paths after graduation. For some, the first path will lead to lifelong careers. Others will change career paths one or more times, and some will find themselves following unexpected paths. All of them, however, will do well to apply the example of a group of Clay County soybean producers to any path they follow.

Vance H. Watson
John Holmes dreams of one day shipping entire golf courses from Georgia to anywhere in the world. Holmes is global sales manager for Phillip Jennings Turf Farm in Soperton, Ga., and his dream may become a reality, thanks to a product developed at Mississippi State University and licensed to Jennings.

The MSU-developed product is a soilless sod that never touches dirt until it is put into place on a lawn, golf course, sports field or other location. It is grown from sprigs using cotton mats and nutrient-enriched water.

Jennings Farms has acquired the rights to commercialize the MSU-patented technology.

Holmes sees the product as a way to strengthen the company’s position as the world’s leader in exporting warm-season turf grasses. Jennings’ overseas customers include golf courses and other upscale developments in the Middle East, the Caribbean and Asia.

The overseas customers, Holmes explained, are willing to pay the additional shipping and other costs to get the quality turf that his company can provide.

“They know they can get a quality product that, in most cases, is not available in their local market,” he said. “That’s especially important for golf courses because the appearance of the
turf is a major factor in determining the visual appeal of the entire project.”

Because of its role in the international market, the Georgia company has made a significant investment in its export facilities, which include a covered, weatherproof building in Soperton to process turfgrass for export. The addition of the MSU soilless sod, Holmes said, will help streamline the process.

“Right now, sprigs are harvested in the field and hauled to the export facility, where they are washed to remove all the soil, dried and treated with a nematocide, fungicide or an insecticide, depending on the requirements of the country we’re exporting to,” he said. “The soilless sod will help eliminate some of those steps.”

MSU’s development of a process to grow sod without soil began about 10 years ago. In 1996, then-graduate student Kevin Lee Hensler published a report on his research with kenaf-based fiber mats to grow turfgrass. Kenaf is a cousin of both cotton and okra that produces a fibrous stalk with a pulp-filled core. A native of eastern Africa, the plant grows well in Mississippi.

“The initial work with using mats to produce sod without soil was part of the research with kenaf,” said Brian Baldwin, an associate professor of plant and soil sciences who directed Hensler’s research. “A patent for the process was applied for in 1997 and received in 2002.”

The process has been refined, and mats produced from cotton byproducts have replaced the more expensive kenaf mats.

“Sprigs of bermuda or a similar grass are placed between two layers of mats and essentially grown using hydroponics, which replaces the soil with a solution of water and nutrients,” Baldwin said. “The mats are placed on a plastic sheet that the roots can’t penetrate, so they remain inside the mat.”

The mats are completely covered in grass in 30 to 45 days, and the mats degrade in about 120 to 150 days, leaving just clean, healthy sod.

“The conventional process for growing sod in outdoor fields produces just one crop a year,” Baldwin said. “The soilless sod process can produce three crops in about the same length of time, and the grass does not go through shock because the roots are never cut the way they are during a conventional sod harvest.”

Soilless sod also weighs significantly less than its conventional counterpart.

“A 5-foot-by-40 foot mat of soilless sod weighs about 50 pounds, compared to about 1,200 pounds for the same amount of conventional sod,” Baldwin said.

For Holmes, weight is an important factor in Jennings’ plans for soilless sod.

“Not having to put sod through the washing process will be a real advantage for our export business, and the ability to save on the cost of shipping the soilless product to domestic customers will also be an advantage,” Holmes said. “Right now, we can get 9,000 square feet of turfgrass on a tractor trailer. With the soilless product we can double that, which is a great thing from a cost standpoint.”

In addition to Baldwin and Hensler, the team that worked on the development of MSU’s soilless sod included horticulturist Nancy Reichert and former staff members Michael Goatley, a turf specialist, and Marty Fuller, an agricultural economist.

“Soilless sod is one of many MSU-based inventions that will be transferred to the private sector for public use,” said Charles Rivenburgh, director of the university’s intellectual property and technology licensing office. “This is one of more than 45 active licenses and 60 patents that MSU currently holds.”
Research is an important part of graduate school, and three students in the Department of Entomology and Plant Pathology at Mississippi State University are receiving significant research scholarships for the current school year.

Master’s degree student David F. McNeill of Louisville, Tenn., has been awarded the L.S. Olive Scholarship of the North Carolina-based Highlands Biological Station. The $2,400 scholarship supports his research into a fungus that attacks American chestnut trees in the eastern United States.

Once abundant from Maine to the Southeast, American chestnuts were almost wiped out by an imported fungal disease during the early 1900s.

“A few pockets of American chestnut trees can still be found in the Smoky Mountains,” McNeill said. “Some of these trees survive until they are about 20 years old because of a virus that attacks the fungus, helping the trees survive.”

McNeill has studied fungus from more than 300 trees from the Great Smoky Mountains National Park in an MSU lab. His research, he said, has found fungus samples with abnormal growth rates and other characteristics that could be caused by a virus. He will be working with those samples during the next few months to determine if a virus is present.

William D. Starrett of Chattanooga, Tenn., also is receiving a $2,400 scholarship from the Highlands Biological Station. The master’s student is studying areas of rhododendron dieback or decline in the southern Appalachians.

“Only one other study has been done, and it looked at what’s happening with the plants above ground, but this is the first research with what’s going on in the soil under the plants,” Starrett said. “My study is focusing on the fungi, nutrients, nematodes and other material in the soil to draw a picture of what’s actually going on.”

Rhododendron, he added, is a major understory species throughout the Appalachian Mountains. The species provides habitat for other plant and animal species.

Doctoral student Sandra W. Woolfolk of Starkville is one of four students selected for $1,500 national awards by the Pi Chi Omega professional pest control fraternity. The award is supporting her research with natural control methods for the red imported fire ant.

“I’m looking at the bacteria and fungi in the soil around fire ant mounds in Mississippi,” she said. “Three or four fungi in soil collected from mounds and studied in the lab appear to have potential for natural control of fire ants.”

Her next step is to study the promising fungi in the field. Woolfolk also is receiving a $3,500 scholarship from the United Methodist Church’s General Board of Higher Education and Ministry.
More than 35 new Mississippi State faculty members who began a trip together as strangers to each other—and to Mississippi—ended it with deeper connections to the university and the Magnolia State.

Faculty members in areas ranging from English to plant and soil sciences participated in the eighth annual Mississippi Tour, a daylong bus journey that introduces newcomers to MSU’s work in the state and to the history and culture of Mississippi.

“It has been a tremendous success in bringing the richness of the university and our state into sharper focus,” said Peter Rabideau, provost and vice president for academic affairs.

The provost’s office sponsors the event, which is coordinated by MSU’s government relations office. Mary Foglesong, the wife of MSU President Robert “Doc” Foglesong, also participated in this year’s tour, which was held Sept. 27.

Among stops on the 16-hour excursion were MSU’s North Mississippi Research and Extension Center in Verona; Elvis Presley’s birthplace and museum in Tupelo; Northeast Mississippi Community College in Booneville; Oxford’s Rowan Oak, home of celebrated Mississippi author William Faulkner; T.W. Dulaney Farms in Clarksdale, a 3,500-acre farming and seed production operation; and the Delta Blues Museum and Ground Zero Blues Club, also in Clarksdale.

“We have found this is a valuable way to immerse newcomers in Mississippi’s heritage, as well as providing a firsthand introduction to MSU’s extensive role in the state,” Rabideau said. “The tour also allows faculty members who aren’t familiar with Mississippi to experience many communities that are home to their students.”

Included in this year’s tour were those whose countries of origin included Peru, Croatia, Macedonia, China and Turkey.
Millions of ducks and geese depend on waste rice—grain that escapes combines during harvest—as a rich source of energy while wintering in major rice-growing states such as Arkansas, California, Louisiana, Mississippi, Missouri and Texas.

Rice producers do not intentionally waste rice, but combines are unable to collect all the rice and some falls to the ground. In fact, recent research conducted in Mississippi State University’s Forest and Wildlife Research Center shows that, on average, about 240 pounds per acre, or about five bushels, of rice remains in fields after harvest in the Mississippi Delta.

The study found that between harvest in September and the first major arrivals of waterfowl in mid- to late-November, about 70 percent of the original deposit of waste rice gets further wasted through decomposition and consumption by rodents, birds and insects. Part of the loss is also from rice seedlings that germinate from the fallen grain but die after the first hard freeze.

By early winter, an average of only about 70 pounds an acre remains in harvested rice fields. That may seem like a lot, but when spread over an acre it is near the level at which ducks will stop feeding, said Rick Kaminski, professor and waterfowl ecologist in the Department of Wildlife and Fisheries.

“There is scientific evidence that ducks stop feeding and abandon rice fields when the ‘giving-up’ density of rice reaches about 45 pounds per acre,” Kaminski said. “Additional research was needed to evaluate strategies that might decrease the loss of waste rice.”

Kaminski, along with former graduate student and now Ducks Unlimited biologist Jennifer Kross and U.S. Geological Survey scientist Ken Reinecke, tackled the problem of how to conserve waste rice during fall in harvested fields. Ducks Unlimited, MSU’s Forest and Wildlife Research Center, the Mississippi Agricultural and Forestry Experiment Station, the North American Wetlands Conservation Council, the U.S. Fish and Wildlife Service, the U.S. Geological Survey, and the states of Mississippi and Arkansas funded the research.

Kross evaluated the effects of postharvest burning, rolling, disking, mowing and no manipulation (control) of rice stubble to determine which strategies conserved the most waste rice. Immediately after harvest, the treatments did not significantly affect the abundance of waste rice, indicating all treatments had a similar starting point in early fall.

“By late fall, however, only standing stubble, burned and mowed paddies contained levels of waste rice above the giving-up density for feeding ducks,” Kross said. “Paddies left in standing stubble contained the most waste rice at 93 pounds per acre, followed by burned at 65 pounds, mowed at 60 pounds, rolled at 45 pounds and disked paddies at 43 pounds.”

Dense standing stubble, she noted, may protect waste rice from seed predators and reduce germination of fallen seed, while fire may kill the embryo of waste seeds and prevent them from germinating.

New research by current MSU graduate student Houston Havens has found that while the most waste rice was conserved by leaving fields in standing stubble, ducks and geese do not use those fields as much as those that are burned or rolled and then flooded.

“Perhaps standing stubble may not provide the optimal interspersion of vegetation and open water favored by waterfowl,” Havens said.

He added that burning conserves the second greatest amount of waste rice, is far more economical than mechanical treatments and remains a legal postharvest field practice in the Delta.

The researchers recommend burning harvested rice fields with a slight head wind. This way, the fire will travel across fields quickly and produce a "patchy" distribution of stubble and open water after flooding.

“In regions of the country where fire is not permitted because of air-quality regulations, the next best strategy appears to be rolling stubble to create openings for ducks and geese to land after fields are flooded,” Havens said. “Mowing and disking are not recommended because both are costly, and disking buries rice seed, making it less available for feeding waterfowl.”

In addition to managing harvested rice fields to maximize availability of waste rice after harvest, the researchers strongly recommend integrating moist-soil wetlands into farmed landscapes. These natural wetlands occur frequently where rice and other lowland agriculture flourish and support a great diversity of natural grasses and sedges that produce abundant seeds and tubers used by ducks and geese.

“Managed moist-soil wetlands can help lessen losses of waste rice, because these unharvested natural crops provide more than five times the seed and duck foraging potential as harvested rice fields,” said Kross, who has also researched seed availability in moist-soil areas.
Rice Program Encourages Research-Backed Decisions

By Robert H. Wells

When Leflore County rice farmer Watson Pillow saved money avoiding additional fungicide expenses and still received excellent results, he knew that he was in the RITE program.

RITE, or Rice Improvement through Technology and Education, is a program funded by rice growers’ check-off dollars and initiated by the Mississippi State University Extension Service and the Mississippi Rice Promotion Board.

Nathan Buehring, an Extension rice specialist based at MSU’s Delta Research and Extension Center in Stoneville, coordinates the program, which is completing its second year in 2006.

“The biggest benefit I get from the program is finding out the best ways to manage my inputs,” Pillow said. “Nathan will let me know if research shows that something doesn’t pay.”

The RITE program was created to maximize profits and yields on Mississippi rice while reducing input costs.

“When we put things into the field, we’ve got data to prove that it’s going to work,” Buehring said. “We’re not going to go out on a limb and risk spending money that may or may not pay off.”

A second component of the program is the verification of rice research performed in Stoneville.

“The RITE program takes the research from a small-scale plot system and puts it out into a larger scale,” Buehring said. “We can do a lot of things in a small plot, but making it work in a large field situation can be two totally different things.”

Buehring had eight fields enrolled in the program in 2006. Fields stay enrolled for two years, and new ones cycle in as old ones cycle out.

“It’s basically a first-come, first-serve basis,” Buehring said. “If someone is interested in enrollment, I will put them on my list.”

Producers enrolled in the RITE program agree to supply all the inputs, and Buehring provides consultation.

The rice specialist works with area agents and fellow researchers to provide support for the program. Problems encountered in RITE fields become potential future research topics.

“Some problems with sulfur deficiencies were identified in the RITE fields this year,” said Tim Walker, an MSU agronomist in Stoneville who specializes in rice production. “Those will go into research probably next year.”

Yields have been good to excellent in RITE fields for 2006, Buehring said, with the lowest yield being 172 bushels an acre. Some fields produced more than 200 bushels an acre. The National Agricultural Statistics Service is predicting Mississippi yields to average 153.3 bushels per acre this year.

“Last year, the highest yield we had in a RITE field was 165 bushels, although there were hurricanes and other factors going into those yields,” Buehring said.

The specialist said expenses will be up this year due to the increased price of some chemicals and the extra pumping needed to combat the drought. However, he said the RITE fields appear to be on par with the state average in rice production expenses.

Fields enrolled in 2006 ranged across the Mississippi Delta from Tunica to Leflore and Washington counties. They varied in location, tillage systems, rotation patterns and varieties.

Buehring scouts RITE fields a minimum of once a week throughout the growing season, and producers are urged to contact the rice specialist if any problems arise between scouting dates.

Recommendations are made on a field-by-field basis and are based on the specific needs of the individual field.

“The ultimate goal within this program is to increase Mississippi rice yields and profits,” Buehring said.
Rural Medical Scholars: A Prescription for Success

Dr. Richard Holmes, second from left, a staff physician with Mississippi State University's student health center, explains human physiology to Erin Newman, Josh Roark and Bonnie Carew, who is the Extension rural health program leader and Rural Medical Scholars director. Biological engineering students Roark and Newman, who are graduates of the Rural Medical Scholars Program, plan to enroll in medical school after graduating from MSU.

By Chance McDavid

A program in Mississippi helps high school students answer the question, “Do I want to be a doctor?”

Rural Medical Scholars is a five-week summer program at Mississippi State University offered through the Mississippi Rural Health Corps that gives eligible students an opportunity to gain hands-on experience in medicine. Except for a small registration fee, scholars receive free tuition, textbooks, housing and a food allowance.

The program is a partnership between MSU’s Extension Service and the state’s 15 community and junior colleges. It allows participants to earn seven hours of college credit, spend time with physicians in clinical settings and tour the University of Mississippi Medical Center. Study skills workshops, social activities and dormitory living make for a balanced college experience for the scholars.

To help recruit applicants, community and junior colleges promote the program to high schools in their districts. Students must have a composite ACT score of at least 25, earn above average grades and be ready to enter their senior year to be eligible to apply for the program.
To date, 194 scholars have finished the program that began in 1998. Fifteen of these scholars are now in medical school. Many others have chosen other health-care careers such as nursing, veterinary medicine or physical therapy.

“These numbers are evidence of the success of the RMS program,” said Bonnie Carew, Extension rural health program leader and RMS director. “We are helping some of the best students in our state decide on careers in medicine.”

Mississippi’s health care system is facing serious challenges and desperately needs to attract young people into medical careers.

“High rates of chronic illness, difficulties in access to services and higher health-care costs continue to take a toll on our health-care system,” said Ann Sansing, Extension community health coordinator and RMS assistant director. “Encouraging students to become doctors who practice medicine in Mississippi is important to the overall quality of our health-care system.”

Sansing said the difficulties in accessing health-care services can be attributed to Mississippi’s shortage of doctors and other health-care providers. The national physician rate is 281 doctors per 100,000 people, while Mississippi’s rate is only 182 physicians per 100,000 people.

“More people in Mississippi, per capita, develop potentially fatal diseases than elsewhere in the country,” Carew said. “And when they do get sick, it’s more difficult for them to secure the care they need.”

Josh Roark of Biloxi is a senior biological engineering major at MSU who served as a RMS counselor for the 2006 class. He graduated from the program in 2002 and attributes his participation in RMS to his decision to apply to medical school.

“The combination of job shadowing experience and the chance to earn college credit at the same time was very beneficial,” he said. “I was a little hesitant at first to give up my summer, but the experience was certainly worth it.”

Lindsay Lankford from Long Beach also served as a counselor in 2006. She is a senior biology major at the Mississippi University for Women and a former RMS graduate.

“I have been interested in attending medical school for a long time,” she said. “RMS is a unique experience that helped me get on the right track to achieving my goal.”

Members of the 2006 class offered a variety of reasons why the RMS experience was beneficial to them. Although some were considering becoming doctors before participating in RMS, they all agreed that the program was a big influence in their decision to pursue medical careers.

Grenada scholar E.J. Juckheim enjoyed the time spent with physicians. “I really liked listening to the head of admissions at UMC and learning the requirements necessary to get into medical school,” he said. “The chance to go out and watch physicians practice medicine was very helpful.”

Sansing said as more and more RMS scholars graduate from medical school or pursue other health-care careers, the students and the state of Mississippi will benefit.

“The RMS program is a summer to remember, offering experiences to grow socially and mentally along with the opportunity to experience the day-to-day practice of medicine,” Sansing said. “Scholars form lasting relationships that will benefit them for many years to come as they pursue their dreams of becoming physicians.”

Kayla Hauss looks through a microscope as Hope Cruse, center, and Whitney Owens prepare to dissect a worm during a lab at the Rural Medical Scholars Program. While enrolled in the five-week 2006 summer program at Mississippi State University, 26 high school students with plans for health-care careers took premedicine courses and shadowed physicians.
Many species of alligators, fish and birds make their home at Mississippi’s largest surface water impoundment, the Ross Barnett Reservoir. Now, however, new residents—aquatic plants that are not native to the area—are invading the reservoir.

Built in 1966, the Ross Barnett Reservoir contains 33,000 acres, mostly between Madison and Rankin counties. The reservoir, managed by the Pearl River Valley Water Supply District, is the primary source of drinking water for the city of Jackson.

“The reservoir provides many recreational opportunities, including campgrounds, parks and trails, as well as residential areas,” said John Madsen, assistant research professor in MSU’s GeoResources Institute. “However, in recent years, invasive species have become an increasing problem on the reservoir.”

Introduced from other parts of the world, invasive aquatic plants affect aesthetics, drainage, fish and wildlife habitat, water quality, irrigation, navigation, recreation, and ultimately land values, Madsen added.

To gain a better understanding of the plant invasion, scientists in the Mississippi Water Resources Research Institute and MSU’s GeoResources Institute are developing an aquatic plant management plan for the Ross Barnett Reservoir.

“The first step in developing a long-term aquatic plant management plan is to assess the reservoir’s plant community by mapping their current distribution,” said Ryan Wersal, research associate in the GeoResources Institute.

To map the distribution of plants, the team used a handheld personal digital assistant outfitted with a GPS receiver. Scientists mapped more than 1,423 points during the study. In addition to sampling for aquatic species, researchers also recorded light intensity and environmental parameters, such as depth, pH and water temperature.

“Of the 14 aquatic plant species observed, only three were exotic or invasive,” said Mary Love Tagert, assistant research professor in Mississippi Water Resources Research Institute. “However, these invasive species occurred one-third as many times as native plants.”

The invasive plants are so prevalent now, Tagert added, that a series of warm winters could allow them to spread to new areas throughout the reservoir.

One of the problems with these invasive species is that they are floating and mat-forming plants that shut out light for more desirable native species.

“The reservoir is a shallow body of water and has the potential to support many rooted submersed native plants,” Tagert said.

Invasive species not only affect water quality, in particular oxygen and temperature, they also can play havoc with fish populations.

“Invasives completely change the structure of the shallow, weeded areas of the reservoir, which impacts the growth, survival and health of fish populations,” said Eric Dibble, associate professor and fisheries biologist in MSU’s Forest and Wildlife Research Center.

The problem is, Dibble added, that invasive species add so much structure to the system compared with native plants, that they can reduce fish populations and health. The long-term result would be a significant reduction in recreational fishing on the reservoir.

The new plants also affect other wildlife, such as birds,
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making it difficult for them to find a good meal because of the mas-
sive floating plant communities. Fewer birds would impact anoth-
er popular recreational activity at the reservoir—bird watching.

One of the newest invasive species found in the reservoir
is hydrilla.

“Hydrilla is a submersed rooted plant that forms a dense
mat and has been detected in several locations in the reservoir,”
Wersal said. “If invasive species such as hydrilla are not con-
trolled, an infestation could easily encompass more than 7,000
acres of the reservoir.”

Funded by the Pearl River Valley Water Supply District,
scientists are actively working to assess changes and the spread of
nuisance species populations on the reservoir.

“We will continue to monitor the distribution of invasive
species as well as implement and assess techniques to control the
nuisance plants,” Wersal said. “Our goal is to promote the growth
of desirable native plants and improve the water quality in the
reservoir and other bodies of water in Mississippi.”

The Mississippi Water Resources Research Institute is a
unit of MSU’s Forest and Wildlife Research Center. The
GeoResources Institute is an affiliate of MSU’s High Performance
Computing Collaboratory.

Joe Mac Hudspeth, Jr., wildlife photographer and native
Mississippian knows firsthand the problem with invasive species.
Hudspeth has been photographing Ross Barnett Reservoir for
more than 20 years.

“I’ve all but lost all of the places I’ve photographed over the
last 16 years. You can’t get to the place where the image of me in
the boat was taken,” Hudspeth said. “The east side of Pipeline
Road on the east side of the reservoir (Rankin County) was ‘taken
over’ five or six years ago.”

Hudspeth went on to say that he would probably lose com-
plete access to the wetlands off Pipeline Road on the west side
of the reservoir (Madison County) within the next two years.

One of Hudspeth’s favorite reservoir spots to photograph
blue-winged teals is now uninhabitable because of invasive
plants.

“I wasn’t able to photograph blue-winged teals last spring
because the ‘hole’ they had been frequenting for several years is
so thick that they can’t land in any water, and I can’t walk to it,”
Hudspeth added.

The problem is such that Hudspeth did not even attempt to
photograph on Pipeline Road this year or last year.

Hudspeth indicated that other places in Mississippi are
also suffering from the invasion.

“The back waters of Bluff Lake at Noxubee National Wildlife
Refuge were invaded so badly that park officials drained
Loakfoma Lake to try to stop the nuisance plants,” Hudspeth said.

Hudspeth, a Lafayette County native, has been published
more than 900 times in national, regional and statewide publica-
tions. In 1993, he received national recognition when his image
of an immature least bittern, taken on Ross Barnett Reservoir,
was selected from more than 2,000 wildlife calendar photographs
and awarded the Grand Prize for Wildlife by the Roger Tory
Peterson Institute for Natural History.

Hudspeth’s photos have appeared on nine Mississippi
Duck Stamps and 10 Mississippi sportsman’s licenses.
Universities often offer parenting classes, but Mississippi State University recently holds an annual international workshop focused on rearing the tiniest offspring: insects.

Initiated in 2000, MSU has hosted nine intensive short courses to teach people from all over the world the lessons crucial to rearing insects in a laboratory setting for research and commercial sales. The workshop is the only formal education on insect rearing provided by any university in the world.

“This workshop gives participants a broad view of all the components to be successful in insect rearing,” said Frank M. Davis, workshop coordinator. “It stresses that insect rearing is a science and an art.”

Davis is an emeritus adjunct professor in MSU’s Department of Entomology and Plant Pathology and retired U.S. Department of Agriculture entomologist with the Agricultural Research Service. He said most universities do not have insect rearing facilities, or insectaries, as large or as sophisticated as the ones at MSU and the adjacent USDA facility.

“I have been doing aphid research in an insect ecology lab and needed to know more. An Internet search for ‘insect rearing’ led me to this workshop, which has exceeded my expectations.”

Sheri Svehla

By Linda Breazeale

(Upper left) Research associate Kathy Knighten explains the finer points of caring for insect eggs to workshop participants. (Above) Anna Sara Hill learned to check butterflies under the microscope for signs of disease during the 2006 workshop. (Left) Insect rearing pioneer Pritam Singh, center, donated his personal research library to MSU during the 2006 workshop. Entomology and Plant Pathology Department Head Clarence Collison, left, and Frank Davis presented him with a plaque commemorating the gift. (Photos by Kat Lawrence)
“Having people here with rearing expertise gives us a core group of lecturers with lots of experience, and then we supplement with the best insect-rearing talent from around the country,” Davis said. “Over the years, presentations have improved and more materials are available. The workshop is a real team effort from the van drivers to the lecturers to the department’s support.”

The workshop covers the major components of a successful rearing program. They include artificial diets, environmental biology, rearing systems, insect pathology (diseases and microbes that contaminate artificial diets), colony genetics, quality control, insectary design, insectary management, safety and health issues.

“We have accumulated an enormous amount of information while providing these workshops. It is enabling us to compile a college textbook on the principles and procedures for rearing high-quality insects,” Davis said. “After its release in 2007, MSU will be able to use the money from book sales plus funds generated from the workshop to help fund graduate studies in insect rearing.”

MSU’s collection of resources dedicated to its Insect Rearing Center grew significantly this fall. Pritam Singh, described by Davis as “one of the pioneers in insect rearing,” donated his personal research library to the university. Davis said the collection includes a copy of the first article published on artificial diets for an insect, the blow fly. The 1908 article was by a Russian entomologist. About 6,500 reprints of papers dealing with rearing insects are in the collection, which concludes in 1992.

“We plan to add to his library and are in the process of computerizing the information so that it can be searched by author, insect species and keywords,” Davis said. “This gives people rearing insects access to much more than just the 8-pound manual we provide in the workshop.”

Participation in the workshop costs $975, plus travel and lodging.

“This is not an inexpensive workshop, but we have had participants return two or three times,” Davis said.

Participants come from a variety of backgrounds. Many work with private companies that develop insecticides or insect-resistant plant varieties. Some produce beneficial insects for organic farming and similar needs. Still others produce insects, such as butterflies, for special exhibits.

Carlos White is an entomologist who became a business- man as the founder of Insect Lore, a California-based company that has grown beyond selling moths to insecticide companies.

“Companies would need insects for research projects sporadically, so we started growing insects to take to schools during the ‘off’ season,” White said. His company now targets schools and retail stores with its nature and science activities.

Along the way, White has found unique opportunities, such as providing a thousand butterflies to be released at the premier of the 1970s movie, “Butterflies are Free.” He also provided larva in various stages of development for NASA to take into space to study butterfly development.

“It took years to figure out the best diet for the butterflies (to prevent deformities),” said White, who recently attended his second insect rearing workshop. He is finding much more information available now than when he started his business.

“With all these specialists gathered together at this workshop, we can learn some of the leading-edge methods, the best antibiotics to use, and information about sanitation and insectary design. The biggest challenge now is anticipating future needs,” he said.

Bill Fisher, an insectary manager with BASF in North Carolina, has been involved as a lecturer with the workshop since its inception. After receiving his undergraduate degree in biology in California, Fisher came to MSU for a master’s in entomology with an emphasis in insect rearing before getting his doctorate at the University of Florida. He said the workshop “fills a worldwide need” for this training.

“At the workshops, I help participants consider management and design decisions,” Fisher said. “This is an intense week, and a special bond forms between all the participants and instructors. More than anything, it establishes lines of communication with the instructors and students for future needs and questions.”

Fisher said people who are successful have the insect equivalent to the gardener’s green thumb.

“People who rear insects have a nurturing intuition,” Fisher said. “The insects are produced in high numbers under hospital-like conditions. It is important to protect the employees’ health as well as that of the insects.”

Sheri Svehla is working on her master’s in entomology at Nebraska. She had eagerly anticipated the workshop for more than a year and was the first to enroll in the 2006 course.

“I have been doing aphid research in an insect ecology lab and needed to know more. An Internet search for ‘insect rearing’ led me to this workshop, which has exceeded my expectations,” she said.

Svehla has future plans to rear Salt Creek Tiger beetles, which are endangered insects located in the Lincoln, Neb., area.

Workshop participant Natalya Abdrashitova, a native of Russia, works in a new commercial business in Hawaii producing beneficial insects for farmers. An entomologist for 10 years, she felt the need to learn management issues and the business aspects of operating an insectary.

“The tour of these (MSU and USDA) labs was helpful,” she said. “I have learned a lot from the participants and speakers.”

Insect lab technician Evelyn Scherrer came from Switzerland for the workshop. Her boss attended a past workshop and felt that she also would benefit from the training. Their lab produces 30 different species of moths, aphids, whiteflies, thrips and plant bugs for pesticide testing.

“The workshop helps me understand why we do things the way we do them,” Scherrer said. “Now I believe my boss and understand his reasons. I won’t argue with him as much in the future.”
Taking the university to the people is the mission of a land-grant institution. Mississippi State University’s four research and extension centers are an important part of the outreach mission.

Scientists and Extension specialists at each center work cooperatively to solve production problems, including those with row crops, livestock, catfish and other agricultural enterprises. They also cooperate in the transfer of new information and technology to area producers.

The centers are located in Verona, Stoneville, Raymond and Biloxi. Each serves as the administrative center for MSU Extension Service activities and Mississippi Agricultural and Forestry Experiment Station research in the surrounding counties.

The North Mississippi Research and Extension Center is located in Verona in Lee County. The center consists of four research locations and a 21-county Extension Service area.

Located in Stoneville in Washington County, the Delta Research and Extension Center’s Extension Service area includes Mississippi’s Delta counties. Research is conducted at the Delta Branch Experiment Station in Stoneville and on farms of cooperating producers in the area.

The headquarters of the Central Mississippi Research and Extension Center is located on the campus of Hinds Community College in Raymond. The center provides oversight for Extension personnel in central Mississippi and for the staff of three major MAFES branch stations.

The Coastal Research and Extension Center in Biloxi serves as MSU’s “southern exposure.” Research and Extension personnel serving the state’s southern counties work out of the Biloxi headquarters, the South Mississippi Branch Experiment Station in Poplarville, four research units, and a seafood-processing laboratory, as well as county Extension offices.

The following pages show a closer look at each of the research and extension centers and how they serve the needs of people in their areas of the state.

**NORTH MISSISSIPPI RESEARCH AND EXTENSION CENTER**

The Hiram Palmertree North Mississippi Research and Extension Center is home to the state’s oldest producer advisory group, which met for the 53rd time in 2006. The group is composed of representatives of the area’s major agricultural enterprises. The men and women in the group make recommendations on the research and MSU Extension Service programs needed by the individuals in their particular enterprise.

Four research locations are administered by the center: the Northeast Mississippi Branch Experiment Station in Lee County, the North Mississippi Branch Experiment Station in Marshall County, the Pontotoc Ridge-Flatwoods Branch Experiment Station in Pontotoc County, and the Prairie Research Unit in Monroe County.

Research focuses on the major crops produced in the northeast area of the state: soybeans, cotton, corn and sweetpotatoes. Livestock production also is an important part of the economy in the region, and research support includes work with pasture and herd management.
Home gardening and small-scale commercial vegetable production are popular activities in northeast Mississippi, and research at the Northeast Mississippi Branch in Verona supports those activities. The MSU Extension Services’ Master Gardener and Junior Master Gardener programs also help area residents pursue their interests in home gardening.

Research in support of area row crop producers is a primary activity at the Pontotoc Ridge-Flatwoods Branch near Pontotoc. The station is located in the state’s major sweet potato growing area, and sweet potato research at Pontotoc includes evaluations of cultivars, pest management practices and plant nutrients. The station also propagates virus-indexed sweet potato slips in a greenhouse from November through May. The slips are then provided to a local producer for seed increase in the field, and the seed is made commercially available to growers.

One of the nation’s most important forages, Marshall rye-grass, was developed at the North Mississippi Branch near Holly Springs and released in 1980. The U.S. Department of Agriculture-Agricultural Research Service conducts soil and water research at the station. MSU researchers conduct a variety of studies with cotton, corn and soybeans on the station’s rolling hills.

Livestock production is the focus at the Prairie Research Unit. Current work includes evaluation of new and promising forage crops for livestock.

The North Mississippi Research and Extension Center is on the Web at msucares.com/nmrec/index.html.

“The annual Scarecrow Trail at the Research and Extension Center’s Fall Garden Expo is something we do to help get children interested in gardening and in the Junior Master Gardening Program and it has worked tremendously well. The Garden Expo also helps get people in the community involved and lets them know about the resources available to them at the center.”

Alice Nunneley, chair, North Mississippi Extension 4-H Junior Master Gardener Program
The Delta Research and Extension Center (DREC) focuses its research and Extension activities on cotton, rice, soybeans, corn, and catfish production.

The major goal of the DREC is to support commercial agricultural and aquacultural enterprises, while at the same time preserving the Mississippi Delta’s environment and natural resources.

The DREC includes the Delta Branch Experiment Station, one of MSU’s 16 experiment stations and research units located throughout the state. The Delta Branch is unique, however, because it has almost a dozen regional and federal agencies within its immediate vicinity with which to share knowledge. The center also includes the Thad Cochran National Warmwater Aquaculture Center.

The physical facilities and scope of research programs have increased since the station’s inception in 1904. The Delta Branch research facility now covers about 1,650 acres total, including about 200 acres of federally owned land. Row crops are grown on about 1,200 of these acres, and soil types vary from very fine sandy loams to heavy clays.

Most of the nation’s farm-raised catfish are produced in the Mississippi Delta, and support for the catfish industry is a major focus at the DREC. There are about 300 acres devoted to catfish research ponds at the center.

The research and disease diagnostic capabilities at the DREC’s Thad Cochran National Warmwater Aquaculture Center have helped producers overcome numerous challenges, said catfish producer Joe Oglesby.

“Over the years, any one of a dozen problems could have broken the industry if not for support from the aquaculture center,” he said.

The DREC has a staff of more than 30 research scientists and more than 100 support personnel. Its network of laboratories, offices, greenhouses, a comprehensive library, and research, engineering, and maintenance shops create an integrated environment.

The nearby Delta Experimental Forest covers almost 3,000 acres of state-owned land.

The DREC brings focus to both the short- and long-term concerns of Delta producers. This enhances the land-grant mission of MSU as producers have access to an interdisciplinary staff for interactive decision-making purposes.

The center impacts changes throughout the Delta, which is one of the primary audiences served by MSU.

More about the Delta Research and Extension Center is available on the Web at www.msstate.edu/dept/drec/.

“They (research and Extension personnel at the DREC) do independent seed trials and variety trials on our soil types. Where else can you get that?”

Gibb Steele, rice producer, Washington County
The Central Mississippi Research and Extension Center was established in 1988 to serve the needs of the central and southern areas of the state in partnership with Hinds Community College and Alcorn State University. Through the partnership, the center helps identify and solve high-priority issues faced by Mississippians in its service area.

Three branch experiment stations are included in the center’s service area: the Brown Loam Branch Experiment Station near Raymond, the Truck Crops Branch Experiment Station south of Crystal Springs and the Coastal Plain Branch Experiment Station in Newton County.

Research at Brown Loam focuses on beef cattle, forages, cotton, soybeans, corn and conservation management.

Beef cattle programs at the station include research with animal breeding, nutrition, grazing management, heifer development, artificial insemination synchronization, forage systems and stocker management.

Row crop research is conducted on cotton, corn, soybeans and wheat to address problems and develop technology for the major crops of Mississippi’s brown loam soil areas.

The Truck Crops Branch Experiment Station, established in 1938, covers 175 acres. Concentration is on production of field-grown and greenhouse vegetables, including organic production. The station is one of 26 sites in North America that conducts All America Vegetable Selection Trials. Scientists at the station also work with tree fruits, muscadines, pecans and ornamental plants. The Truck Crops annual Fall Garden Fest is one of the top horticultural events in the South, drawing hundreds of visitors from throughout Mississippi and surrounding states.

Waste management research at the Coastal Plain Branch Experiment Station includes corn and ryegrass fertilization with broiler litter, as well as the use of broiler litter in a midrotation pine plantation. Variety tests with ryegrass, fescue, hybrid Bermuda and corn for silage are conducted at the station, as well as corn for grain and wheat and oat variety tests. A deer food plot forage variety trail also is under way at the station and there are plans to establish a natural resource enterprise demonstration area that will include a nature center and trail, outdoor classroom and research area.

The Central Mississippi Research and Extension center is on the Web at www.msstate.edu/dept/cmrec/.

“It (the Central R&E Center) is always just a phone call away. I’ve never had a question about anything that they didn’t try to help or at least put me in touch with someone who could.”

Joseph Petitt, organic vegetable producer (shown with Bill Evans, right, assistant research professor at the Truck Crops Branch)
The Coastal Research and Extension Center, headquartered in Biloxi, plays an active role in life along Mississippi’s Gulf Coast and the state’s southern tier of counties.

The center’s mission is to conduct research and education programs that enhance the quality of life of residents of the coastal areas of Mississippi and other states.

The center’s research facilities include the South Mississippi Branch Experiment Station in Pearl River County and its two research units—McNeill and White Sand. The Beaumont Horticultural Unit in Perry County and the Crosby Arboretum in Hancock County also are administered through the center.

The South Mississippi Branch is the oldest branch station of the Mississippi Agricultural and Forestry Experiment Station. It was established in McNeill in 1902 and moved to Poplarville in 1920. Although the system’s oldest, it has state-of-the-art facilities in the recently completed Thad Cochran Southern
Horticultural Laboratory. The laboratory is a U.S. Department of Agriculture facility on the grounds of the station and houses both MAFES and USDA Agricultural Research Service personnel. The building allows federal and MSU scientists to cooperate on projects in the areas of entomology, plant pathology, horticulture, genetics and other areas.

The Crosby Arboretum near Picayune is dedicated to educating the public about their environment. The arboretum’s facilities include a 104-acre interpretive site at the Picayune location and more than 1,000 acres of nature areas at other locations in the Pearl River Drainage Basin. Arboretum personnel and community volunteers offer cultural, scientific and recreational programs to the public. The facility also provides environmental and botanical opportunities, all aimed at preserving, protecting and displaying plants native to the area ecosystem.

Horticulture is an important economic and recreational activity in south Mississippi, and the center plays an active role in both areas. Production and management research with ornamental plants helps meet the needs of the areas commercial nurseries. The center’s personnel also conduct research and Extension programs for the home gardener, with an increasing emphasis on urban gardening. Entomologists at the center are always on the lookout for new species along the coast and for new methods of controlling pests already in the area. Research with Formosan termites, a highly destructive species in southern areas of the state, is under way at the McNeill Unit.

Beef cattle research geared to the needs of the area is conducted at the White Sands Unit. Changes in the dairy industry in recent years have made the southern counties Mississippi’s primary dairy-producing area. Extension agents in the area work closely with producers to provide educational programs and other support.

Another important part of the work at the Coastal Research and Extension Center is support for the seafood industry. The research scientists and Extension specialists at the center work in the areas of product development, use of seafood processing by-products, and educational outreach for seafood industry workers and others.

More on the Coastal Research and Extension Center is on the Web at www.msstate.edu/dept/crec/crec.html.

“They (at the Coastal Center) respond very quickly and come up with some very good solutions. A couple of years ago, they were doing some work with some chemicals, one in particular, that would have a great benefit on some holly scale that we were having issues with. We were able to get right on it once it was licensed, and it has been a great benefit to us.”

Dan Batson, owner, GreenForest Nursery, Perkiston
When Deanna Brown graduated from Mississippi State University’s College of Veterinary Medicine in 1990, she hoped to pursue a career as a large animal veterinarian. She did work as a dairy practitioner in Wisconsin for a year, but today Lt. Col. Brown is putting her expertise to use in a much different capacity.

“I’m originally from Little Rock, Ark., but now I live in Fayetteville, N.C., at Fort Bragg,” she said. “Just recently I led a large animal veterinary workshop in Erbil, Iraq.”

As a U.S. Army veterinarian, Brown is part of a team working to train Iraqi veterinarians and help them refocus on large animal health.

“Most of our emphasis is on improving agricultural production by assisting farmers with improving sheep and cattle production, as well as helping establish private poultry farms,” she said. “We also are working to improve both government and private veterinary services.”

Iraq has about 10,000 veterinarians. About 2,900 are employed by the government, universities or laboratories, and another 4,000 are working at least part time in private practice. Approximately 3,000 are unemployed.

There is a shortage of veterinary drugs and vaccines in Iraq and they often are too expensive for most farmers to afford. Iraqi veterinarians also struggle with basics their U.S. counterparts take for granted.

“Lack of reliable vehicles for vaccination and other treatment activities is one of the most reported complaints by veterinarians,” Brown said. “Clinic staff reportedly rely entirely on taxis for field activities, and the cost severely limits their ability to provide services to farmers.”

Vaccinations against major animal diseases, including those that can spread to humans, are an important part of the work of Iraqi veterinarians.

“Veterinarians in Iraq have many issues to deal with that we don’t in the United States,” Brown said. “They have many significant diseases here, including foot and mouth disease, that we don’t. The country also does not have the infrastructure needed to develop overarching programs to control these diseases.”

Developing an infrastructure is part of the work of Brown and other U.S. veterinarians in Iraq.

“We’ve developed an interagency working group of veterinarians from many different organizations, including the military, the U.S. Department of Agriculture, U.S. universities and the American Veterinary Medical Association,” she said. “Together, we’re helping the Iraqi veterinarians pull together to develop a good plan.”

Their work is beginning to show results, especially in northern Iraq.

“Veterinarians in northern Iraq are on the front lines when it comes to controlling the spread of avian flu,” Brown said. “They have developed a good plan to control the disease in that part of the country.”

U.S. Secretary of Agriculture Mike Johanns has proposed developing a program to train Iraqi agricultural experts to work directly with the country’s farmers, much like Extension Service specialists and agents support agriculture in this country. Such a program, Brown said, could have a significant impact on animal agriculture in Iraq.

“It would be an opportunity for the veterinarians to actually work with the farmers to teach them about what they can do,” she said. “A lot of the veterinarians here are very excited about the possibility of being involved in an Extension-type program.”
Summary of Agriculture in Iraq

By Lt. Col. Deanna Brown

Background on Agricultural Situation in Iraq: Agriculture is the single largest source of employment in Iraq. Despite years of neglect and mismanagement, it continues to be relatively productive. In terms of agricultural practices, Iraq has been in a technological time warp for about the last 30 years. Most farmers are at about the equivalent level to U.S. farmers back in the 1950s to 1960s. Everything has been done in a socialistic system in which national government (i.e., Saddam) provided all of their inputs (seeds, fertilizer, animal protein supplements, fertilized eggs for poultry, etc.). Many of these inputs were low quality, and farmers were given no incentives to improve outputs. In addition, government “food basket” handouts under the Oil-for-Food Program severely reduced the value of Iraqi food products, making it very difficult for farmers to sell on the open market for even a break-even price. The Fertile Crescent, once an agricultural model for the region, exported agricultural products (pre-Saddam), but it is now dependent on imports and “handouts,” and the population is severely protein deficient.

Typical Farm: Most farms are very small, with the majority of them owning between 10 and 30 acres (some less). Farmers grow a small crop of grains (wheat, barley, rice and some corn), along with vegetables (tomatoes, cucumbers, melons, eggplant, squash, onions and potatoes). They usually have a small flock of 20 to 30 sheep and eight to 12 cattle. Almost all farms irrigate through a system of irrigation canals, which have been perfected over centuries of agriculture in the country. Many of these canals are in disrepair, and arable land has been reduced because of high salinity.

Livestock in Iraq: Their primary livestock emphasis is sheep, followed by poultry, then cattle (dual use), water buffalo, goats, and finally camels. They also have an emerging aquaculture industry.

- **Sheep**: are primarily “fat-tailed sheep” (Agassi), which is a breed primarily found in Iraq. This breed is known for its hardiness for the region. They lamb once a year and sometimes twin. Sheep are very important to the Iraqis as a primary protein source, and they are significant culturally because lambs are an important part of religious celebrations. Most countries in the region (including Kuwait) prefer Iraqi sheep to those from other countries and have said they would import Iraqi sheep if they were available.

- **Poultry**: The poultry industry in Iraq was the fastest growing area of animal production during the Saddam regime (the only form of animal production that increased under Saddam). Farmers received significant subsidies and were provided chicks, as well as feed and protein supplements, by the government in exchange for selling birds to government-run slaughterhouses. Most houses measure about 225 by 40 feet and hold between 7,000 and 10,000 birds. Since the war, the number of functioning houses has decreased significantly (less than half remain, and in some areas more than 80 percent are nonfunctioning). Immediately after the war, most hatcheries were looted, and grandparent stocks were lost. The 2005 outbreak of avian influenza resulted in the loss of many of the remaining sources of fertilized eggs in the Kurdish region when flocks had to be killed during the stamping-out process. Currently, poultry farmers cannot get chicks and have difficulty obtaining feed for their birds. When they can get inputs, it costs them much more to produce birds than they can get on the open market because quality of feed is not good.

- **Cattle**: The local cattle breed is a dual-purpose breed that looks similar to a Jersey. In most areas, Holsteins have been crossed with the local breed to improve production. Current milk production ranges from 440 to 3,300 pounds per lactation. Most Iraqis prefer Holsteins, and they want to increase the percent of Holstein blood in their “national herd.” Prior to the war, government-run dairy processing centers purchased much of the milk produced. Now, most of these are inoperable due to looting and neglect. Most families now “process” the milk themselves by boiling and then making butter, cheese and yogurt in their homes. These products are then sold on the local market. Product not sold locally usually gets discarded since transportation to larger markets is difficult and refrigeration is unavailable in most areas. When cattle get old, they are sold for meat. Bull calves also are raised until they reach about two to three years of age and then sold for meat (usually for religious slaughter).

- **Buffalo**: There are specialized farmers who deal specifically with buffalo. These animals are kept primarily for their milk, which is very high in butter fat. The cream is processed locally into sour cream, butter, yogurt and sometimes cheese, and then sold. Buffalo farms often will have up to 100-plus animals, and they tend to be found only in certain locations and always near water.

- **Fish**: Primary breeds are carp (big head, silver carp), which are grown in fish farms owned by individuals. Iraqis love this fish and will pay a premium for it. Most fish farms are not modern and rarely have pumps to aerate. A lack of aeration, as well as water quality problems, significantly inhibits these farms’ productivity. Aquaculture has significant potential if Iraqis can learn modern techniques to raise and market fish.
Fall Garden Events Welcome Hundreds of Visitors

Each fall, Mississippians have two opportunities to satisfy their curiosity about the latest in lawn plants and vegetable varieties. The North Mississippi Research and Extension Center’s Garden Expo and the annual Fall Flower and Garden Fest at the Truck Crops Experiment Station in Crystal Springs treat visitors to gardens filled with flowers and vegetable plants, seminars on home gardening and other educational and fun activities.

Garden Expo

The North Mississippi Garden Expo includes the Scarecrow Trail. The scarecrows, which range from the traditional to the fanciful, are the creations of school groups, businesses, local organizations and individuals.

Flower and Garden Fest

The Fall Flower and Garden Fest is one of the South’s top horticultural activities and draws hundreds of visitors from throughout Mississippi and surrounding states to Crystal Springs. This year was the 28th time Mississippi State University Extension Service personnel and Mississippi Agricultural and Forestry Experiment Station scientists have welcomed visitors to the event.
This year’s recipient of the Carl Norden-Pfizer Distinguished Teacher Award says he is the luckiest person in the world because he teaches what he loves.

Australian by birth, Dr. Andrew Mackin has, in his own words, “worked and trained in quite a few places across the world.” These places include Australia’s Murdoch University Veterinary School, several universities in Canada, and the University of Edinburgh in Scotland. He has been with MSU-CVM for eight years. Mackin also holds specialist board certification in Australia, North America, and Britain.

Mackin said he chose a university career because of his desire to teach.

“I’ve always liked teaching and wanted to be in an environment where I could do that,” Mackin said.

Mackin calls himself an academic clinical specialist, a person who both uses his knowledge and training every day in the workplace and teaches new veterinarians in a clinical environment.

Dr. Ronald McLaughlin, associate professor in CVM’s Department of Clinical Sciences, said Mackin has always been a dedicated teacher.

“He always makes sure the students are learning and that learning is enjoyable. He makes sure they get the best education possible while they’re here,” McLaughlin said.

An internal medicine specialist, Mackin spends at least two hours a day in small-group sessions with students.

“We’re training the next generation of specialists and teachers,” he said.

A professor at MSU since 1998, Mackin said the program has steadily grown since he first came to MSU.

“We’ve been trying very hard to build up the program to train clinical teachers,” he said.

“Last year, proportionately more MSU students matched in the internship and residency program than any other school,” Mackin said. “These are pretty competitive positions, and it says a lot about our training that our students have about a 75 percent acceptance rate.”

Mackin said his job is relatively easy.

“I’m one of the lucky few people because I’m teaching stuff that’s inherently interesting,” Mackin said. “The students are about to graduate, so theory becomes interesting to them when they realize how they are going to apply it to real work.”

Mackin said his favorite teaching trick is simple: “I use real-life cases that students are interested in and invested in since they are caring for the patients.”

As for lecturing, Mackin said he has to be very quick on his feet to handle the unprepared case discussion rounds he must give as many as five times each week. He is unable to prepare specific material for rounds because he does not know what cases he and the students will discuss until the day starts.

He said he also helps students reveal their knowledge through discussion in the daily small-group sessions. Mackin said these interactive sessions teach the students a valuable skill necessary for veterinarians—“that when something new comes through the door, you have to be well-informed and apply theory right now.”

Even when he is presenting “normal” lectures, Mackin said he tries to make the material interesting by showing photographs and relating it to real-life, relevant cases.

“Students are very motivated when they can see the relevance of material,” Mackin said.

Mackin said teachers must exude passion and enthusiasm because they are the role models students aspire to emulate.

“One of my basic rules is I don’t volunteer to give lectures on boring material,” Mackin said with a laugh.

In addition to his duties on campus, Mackin travels statewide, nationally and internationally to lecture to practicing veterinarians, sometimes even running into MSU graduates.

Mackin received his doctor of veterinary science degree in veterinary clinical studies from the University of Guelph in 1994. He received a master’s degree in veterinary clinical science in 1989 from the University of Melbourne. He received bachelor’s degrees in veterinary medicine and surgery (his veterinary degree) in 1983 and veterinary biology in 1981, both from Murdoch University.

Mackin completed a two-year small animal internal medicine internship, followed by a two-year residency in medicine at the University of Melbourne from 1984 to 1988. He completed a three-year small animal medicine residency at the University of Guelph between 1990 and 1994.

Mackin is specifically interested in small animal hematology, hemostasis and immunohematology. His work in animal blood banking has the potential to help human blood transfusions become safer.

Mackin is the Dr. Hugh G. Ward Endowed Chair of Small Animal Veterinary Medicine. He also is a diplomate of the American College of Veterinary Internal Medicine, a fellow of the Australian College of Veterinary Scientists, and immediate past-president of the Association of Veterinary Hematology and Transfusion.
Research Finds Promising Use for Sweetgum Lumber

By Karen Brasher

Sweetgum trees are a common sight in forests across the South, but their usefulness in the lumber industry has been limited.

“The sweetgum tree is a species that is underused,” said Rubin Shmulsky, forest products associate professor in Mississippi State University’s Forest and Wildlife Research Center. “Sweetgum lumber is prone to warp, and the wood color and grain are erratic, which further limits its use for cabinetry and flooring.”

Mixed hardwoods, including sweetgum, are a prolific resource in Southern woodlands, but their market is steadily shrinking. In the past, sweetgum was heavily used for upholstered furniture frames, but the development and acceptance of composite material for frames has significantly reduced the market for sweetgum lumber.

However, collaboration between MSU scientists and an Arkansas-based forest products company has found a promising new market for sweetgum.

“In 2005, MSU began a project with Anthony Hardwood Composites, Inc., to explore the possibility of making a high-value composite from sweetgum lumber,” Shmulsky said. “The primary goals of the research were to assess strength properties, technical feasibility, and lumber yield.”

The MSU scientists set up special equipment to manufacture composite beams from sweetgum lumber supplied by Anthony Hardwood Composites. The rough lumber was sorted, planed, chopped and glued into 6-by-12-inch-deep beams. The beams were then put through a series of rigorous tests to determine their bending strength.

“Results showed that the 6-inch-deep laminated sweetgum beam has a bending strength equivalent to that of a 12-inch-deep solid oak beam, yet uses about half the material, weighs less than half as much and incorporates a lower value raw material,” Shmulsky said.

The success of the project has allowed Anthony Hardwood Composites to design, build and begin operating a commercial factory in Sheridan, Ark. that will eventually employ 100 individuals.

“For production, an abundant and underused species is incorporated, reducing the need to harvest large oak trees to make 12-inch-deep oak mats, the traditional source of industrial matting,” said John Fiutak, general manager of Anthony Hardwood Composites. “The product is targeted for use in remote and environmentally sensitive areas.”

In the commercial product, the individual laminated beams composed of kiln or air dried mixed hardwoods are assembled into patented industrial mats.

“The mats are used as ground flotation material at road, bridge, pipeline, oil rig or other types of construction sites,” Fiutak said. “The beams work well to support heavy equipment in areas where topography and soil conditions are difficult and unreliable.”

The process is environmentally sound with respect to both production and application. Following construction, the mats are picked up and removed, leaving no residual or long-lasting environmental damage.

“The mats disperse vehicular loading so that the soil is minimally disturbed,” Fiutak said.

Additional testing has shown that other underused species and oak also can be used to produce laminated beams for similar applications.
Hurricane Katrina changed the way Mississippi crops leave the state, and more than a year later some producers are still dealing with the change.

Mississippi’s port at Gulfport and the ports at New Orleans and Mobile serve as exit points for much of the state’s crops. Katrina damaged each of these ports, wiping the Port of Gulfport clear of all its structures and temporarily closing the others. Today, all are back in some level of operation, but Gulfport is still in the worst shape of the three.

The Port of New Orleans handled about half of the state’s grain exports before Katrina. Much of the nation’s grain came down the Mississippi River and was shipped out from this port. Steve Martin, an agricultural economist with the Mississippi State University Extension Service operating from the Delta Research and Extension Center in Stoneville, estimated that those exports have regained most of their pre-Katrina status.

“Grain shipments were backed up last fall after Katrina hit, so it took longer and cost more money, but shipments still traveled down the Mississippi River to be shipped from New Orleans,” Martin said. “The only real problem was the expense caused by the delay.”

Martin said the river system is running smoothly now to handle this fall’s harvests, assuming river levels do not drop too much lower.

Poultry exporting, however, is radically different than it was before the storm.

Mike Pepper, president of the Mississippi Poultry Association, said the Port of Gulfport was vital to the state’s poultry industry.

“We depend on cold storage. Before Katrina destroyed the facilities there, we were able to drop off a trailer at the Port of Gulfport and have it unloaded and stored until the ships came in,” Pepper said. “Our product has to be in cold storage, and the facilities at Gulfport were completely wiped off the map.”

Poultry companies have coped with the destruction by moving their shipments mostly out of New Orleans. Pepper said Port of Gulfport officials intend to rebuild the cold storage facilities bigger and better than before, but they are awaiting final insurance and Federal Emergency Management Agency settlements.

“The key is getting a state-of-the-art facility,” Pepper said. “Our goal is to have modern facilities with blast freezers. That’s what the competition has in Mobile and New Orleans, and they are working to make sure they can have it in Gulfport, too.”

Pepper said ports from Houston to Jacksonville, Fla., absorbed the poultry export traffic that had gone through Gulfport, but authorities are confident they can regain that business once they overcome their obstacles and rebuild.

“I think they are very confident they can regain the business they had prior to the hurricane and get even more,” Pepper said.

In May, the Mississippi State Port Authority announced the completion of a 105,000-square-foot warehouse. The port intends to add almost 300,000 square feet of additional warehouse space by mid-2008. The port handled more than 2 million tons of cargo in 2005 and has set a goal of exceeding that tonnage in 2006.
Leadership Emphasized in the Division of Agriculture

By Melissa Mixon
Associate Vice President, Division of Agriculture, Forestry and Veterinary Medicine

“Leaders aren’t born, they are made. And they are made just like anything else, through hard work. And that’s the price we’ll have to pay to achieve that goal (of becoming a leader), or any goal.”
— Vince Lombardi

Each unit of the Division of Agriculture, Forestry and Veterinary Medicine at Mississippi State has its own unique missions and goals, but all are in the business of developing leaders for today and tomorrow through teaching, research and outreach programs.

Leaders in the division were recently asked about their experiences, leadership views and what advice they would give future leaders. Their responses included:

• Look for and take advantage of every opportunity.
• People grow to the level of expectation – set the bar high.
• Provide opportunities to feel secure taking chances.
• The only limitation placed on aspiring leaders in the division is themselves.
• Establish a plan and a goal and continue to grow.
• Don’t get discouraged.
• Be flexible.
• Rise above the situation.
• Never say never.
• Ask why, not why not.
• Keep a balance between professional and personal goals.
• Identify a strong support system.
• Identify a mentor and be a mentor.

More than 50 organizations in the division provide opportunities for students to develop leadership skills by leading fellow students. Each of the three colleges has ambassador programs where students sharpen their speaking, writing and service skills. The MANNRS, or Minorities in Agriculture and Related Sciences, is a national organization that provides a network between minority natural resource and agriculture students and professionals from academic institutions, government and industry. MANNRS prepares students for leadership roles by involving them in leadership activities, educational opportunities and job readiness for a lifetime of professional service.

Students interested in international leadership experiences have opportunities through study-abroad programs and the extensive international research programs established by faculty in the division.

Division-sponsored leadership opportunities extend to the young people of the state through outreach programs. Statewide, more than 90,000 young people are involved in 4-H and its unlimited opportunities to develop leadership skills.

The Mississippi State Agriscience Institute for Minority Students (MS AIMS) provides hands on experiences for high school juniors and seniors through agri-science, natural resource and agribusiness activities on the MSU campus.

Faculty and staff development programs are critical to the continued development of leaders. Faculty participate in many national leadership programs, including Lead21 and the Food System Leadership Institute (FSLI).

Lead21 develops leaders in land-grant institutions. Likewise, FSLI develops individual and institutional leadership for the 21st century.

Faculty throughout the division serve in leadership roles in their professional organizations. A mentoring program is available to all faculty—teaching, research, extension and clinical—for their first three years at MSU. The program provides them with the tools they need for a long and successful career at the university.

Professional and support staff leaders are critical in day-to-day operations and the division strives to hire the best individuals and invests in their development and retention.

The annual Women in Management program focuses on vital management and leadership skills. MSU has participated in the program for more than 30 years.

Professional and support staff members also have opportunities to participate in programs such as the Mid-Level Leadership Training Program. In its sixth year of existence, the program mentors and develops employees often overlooked by other training programs.

Employees are encouraged to strengthen their personal and professional skills by enrolling in academic courses at MSU.

Finally, as leaders develop, it is important to celebrate successes, and the division seeks every opportunity to recognize employees for their accomplishments in serving the clientele of MSU, industry and the state. A quick inventory of the awards and recognitions in recent months shows more than three dozen.

Points of pride are submitted by individual units and are updated on a regular basis. These can be found on the division Web page at www.dafvm.msstate.edu. Please take the time to visit the Web page and join us in celebrating our successes.

If your actions inspire others to dream more, learn more, do more and become more, you are a leader.
— John Quincy Adams
New Book Takes Readers on Outdoor Adventures

A collection of short stories and conservation essays by a veteran Mississippi State fisheries biologist and nationally recognized conservationist now is on bookshelves.


Jackson is a teacher and researcher in MSU’s Forest and Wildlife Research Center, a part of the College of Forest Resources.

“Tracks is a pilgrimage through the wild, beautiful and lonely places around us,” Jackson said. “Its purpose is to invite readers to share the trail and discover connections to different vistas not only in the South, but also in distant lands and on exotic waters.

“I’ve attempted to bring into focus the natural thrill of participating fully as part of the chain of life in wild places,” added the avid hunter, fisherman and trapper.

Jackson said proceeds from the book sales will be used to support the fisheries program in MSU’s Department of Wildlife and Fisheries.

Earlier this year, he was elected second vice president of the American Fisheries Society and will become its president in 2009. He also currently serves as president of the Mississippi Wildlife Federation and chair of the American Fisheries Hurricane Relief Task Force.

An Arkansas native, Jackson holds bachelor’s and master’s degrees from the University of Arkansas and a doctorate from Auburn University.

Helping Children Aim High

Sheran Watkins, third from right, recently received the 2006 National Association of 4-H Agents Air Force Aim High Award. As the 4-H youth development agent in Harrison County, Watkins has worked with Air Force staff to establish 4-H clubs on bases and to provide support of children of deployed service members. She has provided training and professional development opportunities to Air Force staff and has integrated these military programs and youth into the ongoing 4-H Extension programs in her county. Watkins is shown helping children at Kessler Air Force Base in Biloxi prepare a parents’ appreciation dinner.
Mobile Veterinary Clinic Hits the Road in 2007

From tragedy often comes valuable lessons for the future.

When Hurricane Katrina hit, many animals were abandoned and left with no one to help. The College of Veterinary Medicine is taking steps to be better prepared to respond to the needs of animals during the next emergency.

The college, in partnership with the American Kennel Club Companion Animal Recovery (AKC CAR), is developing a mobile response unit for use during any disaster in which small animals are left injured or abandoned.

The AKC CAR is providing partial funding through a gift of $100,000 to purchase and equip the mobile clinic. Additional long-term funding is needed for staffing, supplies and expenses to sustain the unit in the years ahead.

“AKC CAR is dedicated to reuniting lost pets with their owners,” said Jason A. Miller, AKC CAR assistant vice president. “Mobile response units allow veterinary professionals and volunteers to provide much-needed care as quickly as possible. AKC CAR and our supporters are thrilled to provide MSU funding to accomplish this goal.”

The clinic, estimated for completion in spring 2007, will be a 32-foot gooseneck trailer equipped with a full surgical suite, a treatment room and a holding ward capable of housing up to 16 animals. It will provide full digital radiographic and laboratory diagnostic capabilities, emergency triage services and even minor surgery for injured animals.

While emergency response is the primary goal of the clinic, it also can be used in rural areas underserved by private veterinary hospitals.

“We believe it will be gratifying to see the results of this clinic. Our work will not only affect the reproductive rate, but also the number of animals being euthanized,” said Dr. Philip Bushby, CVM Marcia Lane Professor of Humane Ethics and Animal Welfare. “It will increase adoption rates, improve the health of shelter animals, and reduce the number of unwanted litters of puppies and kittens.”

The clinic, Bushby added, also will help increase adoption rates.

“Many people go to a shelter and see an animal they like but hesitate to take it home because of the initial expense of vaccinations and sterilization,” he said. “When they learn everything has been taken care of at least until the pet’s next vaccinations are due, they will be more likely to adopt an animal.”

The mobile clinic will also provide extensive surgical experience for CVM students while supplying communities with a needed service.

If you are interested in helping animals through this program, contact Keith Gaskin, director of development for CVM at (662) 325-3815.
Waterfowl/Wetland Conservation Scholarship Established

A Georgia-based company is doing more than building upscale residences these days. Scenic Homes, a family-owned business, also is working to further waterfowl and wetland conservation through a $424,000 scholarship endowment recently established at MSU.

The owner and partners of the construction firm—which also has offices in Mississippi, Louisiana, and North and South Carolina—have established the Scenic Homes “Dr. Richard M. Kaminski” Scholarship in Waterfowl and Wetlands Conservation.

The academic award will provide qualified students with $8,000 annually for tuition, fees, housing, books and supplies. “We are excited about the opportunity to provide scholarships for students interested in careers as waterfowl or wetlands ecologists, managers or conservationists,” said Scenic Homes owner Paul Meng.

A former Natchez resident now residing in Atlanta, Meng also is an outdoors enthusiast and wildlife conservationist.

Scenic Homes/Kaminski scholars must be enrolled full-time in pursuit of a bachelor’s degree in wildlife and fisheries science from the College of Forest Resources. An MSU grade-point average of 3.0 or higher (based on a 4.0 scale) and involvement in professional and leadership organizations in their field of study also are required.

“The scholarship is timely, considering that many waterfowl teaching and research programs in the U.S. and Canada are disappearing,” said Kaminski, the nationally known MSU wildlife and fisheries professor the scholarship honors.

“Data from a recent survey indicate the availability of college-level training, including research opportunities, for aspiring waterfowl biologists could be halved within a decade,” he added.

Kaminski said the Scenic Homes scholarship endowment will help ensure that MSU students can pursue “their passion for waterfowl and wetlands ecology and management.”

Since 1990, Scenic Homes has constructed more than 6,000 homes throughout the Southeast and is considered one of the top 100 builders in the U.S. As a member of the National Association of Home Builders, the company has been honored with the QBW Golden Achievement and QBW Builder of Integrity Awards in 2003 and 2004, respectively.

For more information on establishing scholarships in the College of Forest Resources, contact Jeff Little, director of development, at (662) 325-8185.

Couple’s Gift Honors “Love Affair” with MSU

One day June Pace read about the need for private funds for scholarships at MSU. She immediately sent in a gift to the State of the Future campaign in honor of her husband, John, not knowing she would eventually create a lasting legacy for the two of them.

John Pace, a 1956 agronomy graduate, enjoyed a long love affair with Mississippi State. He died in February 2006. Now, John and June’s loyalty to Mississippi State will continue in perpetuity. A bequest of the couple’s entire estate will one day provide scholarships in the College of Agriculture and Life Sciences.

John, a native of Lake, graduated from Hinds Community College and then attended Mississippi State with the aid of the Montgomery G.I. Bill.

“I wanted to do something that would benefit a lot of students, so I decided on scholarships in the College of Agriculture and Life Sciences, where John got his degree,” June said. “Although John attended Mississippi State with assistance, he realized that many students work their way through college, and I would like to help them because that is what he would have wanted.”

John was employed with Jackson’s Cyclone Fence Company, a division of U.S. Steel Corporation, for 33 years. A staunch MSU supporter throughout his life, he and June were members of the Ag 100 Club in the College of Agriculture and Life Sciences.

“Early in our 49-year marriage, I was a little jealous of the fact that he was so wrapped up in Mississippi State, but as time went by, I too learned to really appreciate the university,” June, who resides in Jackson, said emphatically. “For us, Mississippi State has always been the only university in the state of Mississippi. In fact, John read everything he could get his hands on about what was going on at State and the tremendous progress the university was making.”

John Pace’s spirit of philanthropy and patriotism was apparent in everything he did. A member of the 1st Marine Division during the Korean War, he will forever be remembered as one of the “Chosin Few,” the survivors of a three-week battle in the snow-covered mountains around North Korea’s Chosin Reservoir. The 1950 battle earned a place in military history as one of the most savage ever fought.

For more information on giving to the college, contact Jud Skelton, director of development, at (662) 325-0643.
It’s all in the name. Check it out for news and information from the Division of Agriculture, Forestry and Veterinary Medicine.