In 1923, American entrepreneur Henry Ford wrote, “Experience is the harvest of life, and every harvest is the result of a sowing.” In 2015, the Mississippi State University Division of Agriculture, Forestry, and Veterinary Medicine (DAFVM) benefited from its history of sowing strong partnerships, forward-thinking capital improvements, and quality programs.

MSU and all of its units rely on federal, state, county, and private funds to offer competitive basic and applied research programs, practical and research-based outreach and Extension programs, and ambitious academic programs. We could not fulfill our land-grant mission without our valued partners. This year the Mississippi Legislature awarded a five percent funding increase to DAFVM units. Division faculty and staff secured approximately $77 million in grants and contracts. Funding from a variety of sources allows us to advance initiatives designed to address the pressing needs of Mississippian, our nation, and the growing global population.

The MSU campus continues to expand to accommodate its increasing enrollment and the demands of a high-tech world. DAFVM had 3,414 of MSU’s 20,873 enrolled for the fall 2015 semester. Construction of the new classroom building at the Wise Center was completed in October. Construction on the new meat science and muscle biology laboratory to be built near the Wise Center is scheduled to begin in early 2016. We are also making progress with plans for the new Animal and Dairy Sciences and Poultry Science buildings. We expect that construction of these buildings will start in fall 2016.

In addition to growing our capacity to provide high-quality facilities, division units expanded their degree programs and course offerings in 2015. Of special note is the new certificate program in precision agriculture. Units also reaffirmed their commitment to excellence and professional standards. For example, the College of Veterinary Medicine received reaccreditation by the American Veterinary Medical Association’s Council on Education.

We welcomed several new leaders to the division this year as we filled key positions, including Andrew Kouba, head of the Department of Wildlife, Fisheries, and Aquaculture; Will Evans, head of the Department of Food Science, Nutrition, and Health Promotion; Ron McLaughlin, associate dean of the College of Veterinary Medicine; Steve Turner, director of the Southern Rural Development Center; Steve Martin, Extension associate director for agriculture and natural resources; and four Extension regional coordinators: Linda Mitchell (northeast), Wayne Porter (southeast), Curt Lacy (Delta), and Byron Williams (southwest).

Several units from the division joined with our partners to promote Mississippi agriculture at the Sunbelt Ag Expo in Moultrie, Georgia, in October. As the spotlight state, Mississippi enjoyed a great deal of attention from thousands of expo attendees who sampled catfish, shrimp, sugarcane, sweet potato, and soybean products. They learned what residents and natives know already: life is “Sweeter in Mississippi.”

This fall MSU launched a new brand awareness campaign, and it highlights one of President Keenum’s primary objectives: finding solutions for the issues surrounding global food security. We are proud to partner with President Keenum to create video messages featuring DAFVM’s research and Extension programs. Telling compelling stories is part of this marketing initiative, and everyone in the division has an important story to tell about our work. We hope you enjoy reading a small portion of these stories in this annual report.

With thanks for your continued support and advocacy,
The College of Agriculture and Life Sciences (CALS) has 2,387 students, and with its 8.2 percent increase this fall, is one of the fastest growing colleges on campus. In addition to a growing undergraduate student body, the college is home to 252 master's students and 158 doctoral students. Graduate student education continues to expand as students work with faculty to make meaningful research discoveries that advance agriculture and life sciences.

Two programs in Plant and Soil Sciences celebrated anniversaries this year. For 80 years, the University Florist has provided a place for MSU students to hone the skills required for success in the floral industry and beyond. The turf management program, which boasts more than 450 graduates, turned 50 in 2015.

In addition to 16 majors and 47 concentrations offered to CALS undergrads, the School of Human Sciences added a new concentration in Agricultural Communications to the Agricultural Information Science degree. Also, Hinds Community College and MSU forged a new 2 Plus 2 partnership in precision agriculture that will strengthen Mississippi's agricultural economy.

The college offers a concentration in precision agriculture through the agricultural engineering, technology and business major. A new certificate program for students in Agricultural Economics; Agricultural and Biological Engineering; Biochemistry, Molecular Biology, Entomology, and Plant Pathology; and Plant and Soil Sciences is coming soon.

Distinguished alumnus Dr. Will Carpenter presented the Charles Lindley lecture series in 2015. During the lecture series, the Monsanto Company established the Will D. Carpenter Distinguished Field Scientist Graduate Assistantship in honor of Dr. Carpenter. The assistantship was awarded in 2015 to two agronomy graduate students.

The Undergraduate Research Scholars program grew from 22 students in 2014 to 30 students in 2015. Also, The Center for Retail and Cotton Product Development was established this year to provide research, outreach, and educational opportunities for students and to coordinate programs between MSU and national and regional corporate organizations.

Study abroad opportunities grew as well. Fashion design and merchandising majors in the School of Human Sciences and landscape architecture students studied in Italy this past summer.

The landscape architecture major and the Food Science, Nutrition, and Health Promotion dietetics curricula and internship program received reaccreditation from their respective professional societies.

CALS faculty and students continue to win awards regionally, nationally, and internationally.

Late in 2015, CALS welcomed Will Evans, head of the Department of Food Science, Nutrition, and Health Promotion.

Through each endeavor, the college strives to impact the future of agriculture and life sciences with an exemplary student body, internationally renowned faculty, and excellent alumni mentors and support.
The Mississippi Agricultural and Forestry Experiment Station advances the fields of agriculture and natural resources through teaching and learning, research and discovery, and service and engagement. MAFES seeks to increase economic prosperity and environmental stewardship, build stronger communities, and improve the health and well-being of families.

Throughout the 16 branch stations in Mississippi, Experiment Station scientists work in all soil types, topographies, and climates to improve agricultural and animal production systems while increasing food safety and quality.

MAFES scientists conduct variety trials throughout the state to provide an objective evaluation of corn, cotton, grain sorghum, rice, soybean, wheat, oat, turf, and forage crop selections. In an effort to continuously improve the variety trial program, an external review was performed in 2015. In addition, producers can now access variety trial findings quickly and easily at http://www.mafes.msstate.edu/variety-trials.

MAFES research projects make a difference in the lives of Mississippians, providing practical solutions for individuals and companies. Experiment Station scientists recently patented a vaccine and delivery method to protect catfish from commonly occurring bacteria that can kill them, reducing production and costing the industry millions each year. Experiment Station scientists also received patents for vibrio, salmonella, and listeria test kits that easily, rapidly, and cost-effectively detect food-borne pathogens to help make food safer.

The Federal Aviation Administration's designation of MSU as a National Center of Excellence for Unmanned Aircraft Systems helped position the Experiment Station as a leader in precision agriculture. Experiment Station scientists use UAS to monitor crop populations, insect and disease pressure, and herbicide drift, all in an effort to help producers improve their efficiency.

Several Experiment Station scientists were honored for their research and service in 2015. A DuPont Pioneer gift established a fund honoring longtime entomologist Frank Davis. The gift helps fund the insect-rearing workshop Davis founded and enhances facilities. In addition, two Plant and Soil Sciences faculty members were designated chair holders: Dr. Dan Reynolds as the Dr. Edgar E. and Winifred B. Hartwig Endowed Chair in Soybean Agronomy and Dr. Jac Varco as the Dr. Glover B. and Imogene C. Triplett Endowed Chair in Agronomy.

State-of-the-art facilities are essential for a leading research program. The Custer Dairy Processing Plant has been upgraded; a new meat sciences laboratory has been funded; and poultry science and animal and dairy sciences buildings are currently being planned.
2015 was a banner year for the College of Forest Resources (CFR) with the introduction of a new major, a leading student body, and exceptional faculty.

This year, CFR introduced the sustainable bioproducts major. Students in this multidisciplinary program study wood and non-wood composites, other contemporary engineered products, lumber, chemicals, fuels, medicines, and more. The other majors in the college are forestry; wildlife, fisheries, and aquaculture; and natural resources and environmental conservation.

The Arbor Day Foundation designated MSU a Tree Campus USA this year. More than 10,000 trees grow on the MSU campus, with an additional 80 to 100 trees planted annually. CFR faculty, staff, and students, along with the Campus Tree Improvement Committee, were involved in the designation and are working on a campus-wide inventory of forest resources.

The Mississippi Wildlife Federation named CFR the Conservationist of the Year. The award, sponsored by Chevron, recognizes the college’s efforts in preparing the next generation of conservation leaders. The only nationally accredited four-year natural resources degree program in Mississippi, CFR has graduated more than 4,000 students in its 60-year history.

The student body won international, national, and state competitions for research and service. The MSU Student Chapter of the Society of American Foresters was ranked in the top three for the sixteenth consecutive year. The chapter also hosted the 58th Annual Southern Forestry Conclave, a time-honored friendly competition among 15 Southern forestry schools. MSU’s Wildlife Society Student Chapter placed in the top three in the Southeastern Wildlife Conclave quiz bowl.

CFR welcomed Andrew J. Kouba, the former director of conservation and research at the Memphis Zoo, as the new head of the MSU Department of Wildlife, Fisheries, and Aquaculture.

CFR manages the ever-expanding Bulldog Forest, which includes 28 properties totaling more than 30,000 acres. These properties serve as a living laboratory for students, and Bulldog Forest timber sales generate dollars for scholarships and other development activities.

As we continue to grow our student body, we look forward to next year and the opportunities we have to promote, support, and enable the management, conservation, and utilization of forest and other natural resources to benefit the stakeholders of Mississippi, the nation, and the world.
The MSU Forest and Wildlife Research Center (FWRC) researches issues in forestry, sustainable bioproducts, and wildlife and fisheries to expand the knowledge base of these disciplines. FWRC scientists help Mississippians conserve, develop, and use the forest, forest products, wildlife, and fisheries resources of the state, the nation, and the world.

FWRC scientists are currently engaged in 237 research projects involving 91 sponsors. These projects aim to improve wildlife habitats and populations, extend wood products, and develop new methods to improve forest resources. Below are a few recent discoveries.

In fisheries, scientists are working to manage and optimize crappie reproduction. Mississippi hatcheries produced over 500,000 crappie to stock Mississippi lakes during 2013-2014. FWRC scientists developed new methods to induce female spawning in a tank system without seasonal restriction, allowing biologists to manage the reproduction process and timing and increasing hatchery efficiency.

FWRC scientists are studying black bear travel corridors and habitat in Mississippi, Missouri, and Michigan in order to maintain adequate populations.

Landowners today have access to pine seedlings far superior to those available a few decades ago. Advanced genetic seedlings can resist disease and have high rates of survival and growth, producing uniform plots and an economic premium for landowners. FWRC scientists are examining landowner advantages of planting these seedlings.

Hardwood bottomlands produce high-value wood products and ecosystem services including wildlife habitat, carbon sequestration, nutrient processing, water storage, and filtration. Scientists have also discovered how bottomland hardwood forest filtering affects downstream water quality.

Scientists in sustainable bioproducts work to add value to Southern forests. Quick growth, coupled with early thinning of stands, results in forest products with different characteristics than those grown from older timber harvested generations ago. Researchers are conducting lumber grade, stiffness, and strength tests that will inform building code standards.

To protect wood products after installation, FWRC scientists are evaluating methods to improve Southern pine deck board performance. They hope to create a process that improves the appearance, longevity, and decay resistance of Southern pine deck boards.

FWRC scientists in the Center for Resolving Human-Wildlife Conflict work to improve human-wildlife coexistence and reduce conflicts. Since wild hog damage and control costs currently total $1.5 billion nationally, the center is conducting research to document the extent, type, and economic impacts of hog damage in Mississippi.

From improving wildlife populations to extending timber resources, the FWRC conserves natural resources and enhances economic prosperity in Mississippi and beyond.
Mississippi State University College of Veterinary Medicine graduates have a real opportunity to be at the forefront of solving many global problems, curing diseases, and developing new medical treatments for animals and humans through disease research, work in food safety, caring for family pets, and protecting public health.

MSU’s CVM has had an eventful year full of growth. The American Veterinary Medical Association’s Council on Education announced this spring that the college has once again earned accreditation. One of just 28 accredited veterinary colleges in the United States, CVM has been recognized by the U.S. Department of Education and non-profit Council for Higher Education Accreditation to certify higher education training in the profession. The COE’s stamp of approval is recognized internationally as a designation for colleges that reach the highest standards.

The council uses 11 standards to evaluate programs, including curriculum, clinical resources, finances, facilities, faculty members, and research programs. The organization also assesses a college’s commitment and success in carrying out its animal-care missions. CVM prepared for the evaluation for approximately one year. During that time, the college produced a comprehensive, 100-page self-study that demonstrates how it meets all criteria and standards.

To keep pace with a growing patient base, CVM has expanded the Joe Ann Ward Internal Medicine Critical Care Unit. The unit provides more technology and space to serve the needs of patients requiring intensive care. The college has also acquired a Lutzbot Taz 4 3-D printer at the Veterinary Specialty Center. This printer enables the neurology team to develop new ways to correct spinal and skull injuries in animals. This technology offers something unique and helpful both to patients and to students who study veterinary neurology during a required fourth-year rotation at VSC.

The CVM welcomed an additional oncologist to its Animal Health Center team and new therapies for treating injuries in horses. These efforts are part of teaching students the newest advances in veterinary medicine and improving animal care options in the state.

MSU’s CVM is proud to continue to serve the region through updated animal health services, industry support, and research. CVM faculty, staff, and students are excited about the changes happening every day in veterinary medicine and remain dedicated to making advancements in teaching, research, and community service.
From a big crowd at the Row Crops Short Course to individual accomplishments in 4-H competitions, the Mississippi State University Extension Service plays an important part in the lives of Mississippians of all ages and interests.

One of this year’s highlights was sharing reasons life is “Sweeter in Mississippi” at the Sunbelt Ag Expo in Moultrie, Georgia, in October. Extension coordinated the effort with contributions from key partners, including the Mississippi Farm Bureau Federation, Alcorn State University, and the Mississippi Department of Agriculture and Commerce. From fried catfish, Edam cheese, and sweet potato bread bites to numerous exhibits showcasing Mississippi agriculture, Expo attendees learned how Mississippi has earned its reputation as the hospitality state.

For Mississippi’s agricultural producers, our MS Crops Team continued to teach producers about the 2014 Farm Bill and how it affects them; new and emerging crop pests, weeds, and diseases; irrigation; variety selection; and management. Extension is dedicated to helping its clients be as efficient as possible to maximize profits.

MSU Extension’s Therapeutic Riding Program received national reaccreditation and continues to serve as a model program for working with both children and adults who have special needs.

External grants and contracts totaled $25,669,926, an increase of $8,253,140 since FY2013. This is a 34 percent increase in two years, and 17 percent of the MSU total for FY2015.

Based on a statewide survey of the general public, county advisory council members, and Extension agents, Extension identified five major imperatives and 10 program planning areas, with committees established for each area to develop the statewide Plan of Work. The 10 areas are plant systems, environmental systems, forestry, animal systems, wildlife and fisheries, environmental sustainability and pest management, community resource and economic development, enterprise economics, family and consumer education, and 4-H youth development.

This new Plan of Work will establish standards of excellence, specify duties and responsibilities for each level of Extension programming, reconnect counties to faculty expertise for developing and delivering programming, create an in-service training program, institute a digital measurement system, and set up an agent mentoring program.

New Extension Faculty Benchmarks are now part of the DAFVM faculty annual evaluation form.

Increased funds from the legislature enhanced the MSU 4-H Rural Medical Scholars program.

A new memorandum of agreement between the 4-H Foundation of Mississippi and Extension includes new bylaws.

Now in its 101st year, Extension continues to make a difference in the lives of Mississippians.
ADMINISTRATION

MARK E. KEENUM
President
Mississippi State University

GREGORY A. BOHACH
Vice President
Agriculture, Forestry, and Veterinary Medicine
KENT C. HOBLET
Dean
College of Veterinary Medicine

GEORGE H. HOPPER
Director
Forest and Wildlife Research Center

Director
Mississippi Agricultural & Forestry Experiment Station

Dean
College of Agriculture and Life Sciences

Dean
College of Forest Resources

GARY B. JACKSON
Director
Mississippi State University Extension Service
Mississippi ranked among the Top 20 States in the production of 15 agricultural commodities.
2015 farm-gate value of ag and forestry production
(includes government payments)
$7.4 BILLION

2015 value added to the Mississippi economy by ag and forestry
$16.1 BILLION

R&D expenditures by MSU in agricultural sciences
$99.0 MILLION

CORN YIELDS
175 bushels/acre

COTTON YIELDS
1,021 lbs./acre

SOYBEAN YIELDS
46 bushels/acre

SOYBEAN PRODUCTION
105 million bushels

BROILER PRODUCTION VALUE
$2.88 billion*

PEANUT PRODUCTION
151 million lbs.

EGG PRODUCTION VALUE
$328 million*

* record level
RANKED #8 NATIONALY

TOP 10 SINCE 1998

In Total Higher Education R&D Expenditures in AG Sciences | FY 2014

Source: National Science Foundation Higher Education Research and Development Survey | FY 2014

DAFVM TOTAL EXPENDITURES

Combines CVM, FWRC, MSUES, and MAFES. E&G funds include state, federal, tuition, sales, etc. All other sources include restricted and designated funds.

DAFVM ENROLLMENT

DAFVM GRANTS & CONTRACTS RECEIVED

MISSISSIPPI STATE UNIVERSITY
Division of Agriculture, Forestry, & Veterinary Medicine
ANNUAL REPORT 2015
An MSU Extension Service office is located in each of the 82 counties.