MAFES Research Highlights

Cover

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Contents

From The Director

"Before the people there was the Land ... It had to be there for them to come to; it had to be there for child and man to play upon and for the generations of people to till and to be buried in. It shaped the lives of the Mound Builders. It has been shaping the lives of the people who have lived upon it ever since. What is it like -- this land?"

With these words, Mississippi State University history professor John K. Bettersworth introduced his 1959 textbook, *Mississippi: A History*, to generations of school-age children.

This land that comprises Mississippi is located between 30 degrees 13 minutes and the 35th parallel. At its greatest width, the state measures 180 miles, and its greatest length is 330 miles. With 47,716 square miles, Mississippi has 11.6 million acres in farmland.

From the beginning, the land, forests and water have influenced the lives of the area's residents. Before the first Europeans appeared in the 1540s, more than 30,000 Native Americans, including the Choctaw, Chickasaw, Yazoo, Natchez, Biloxi, Pascagoula, Tunica and Chakchiuma tribes lived off the land.

Organized in 1798, the Mississippi Territory grew quickly as settlers from older southern states moved to the new area. They found the soil ideal for producing a Mexican variety of cotton that grew well in Mississippi's damp soil and climate. Mississippi became a state in 1817, and by 1860, led the nation in production of cotton.

Until World War II, most Mississippians earned their livings from agriculture, and 75 percent of the people lived on farms. Cotton was king and was produced with hoes, mules and plows. Little was known about the scientific agriculture that now improves production of crops and livestock.

Today, with a strong research foundation through MAFES, Mississippi's agricultural production is more diverse and in addition to cotton, includes poultry, catfish, soybeans, rice, corn, sweetpotatoes, wheat, ornamentals, beef, dairy, swine and timber. Figures from 1998 showed 27 percent of the state's income comes from agriculture and forestry.

In this *Highlights*, MAFES shares several updates of its current agricultural research:

Catfish production is a relatively new source of income in east Mississippi, and several MAFES scientists are helping the area adapt to the production of the state's choice food fish. Learn more about its production in the Blackland Prairie in the article East Mississippi Reels in Catfish.

To increase production of Mississippi agriculture, MAFES researchers are investigating additional applications of satellite technology and remote sensing. A recent tour to several research sites in the state is featured in ASTA Tour Blasts Off.

Research updates are a primary goal of annual field days hosted at several of the 16 MAFES sites around the state. Read about these in the section, MAFES Shows Off Research at Field Days.

A MAFES researcher has evaluated using grasses to reduce agricultural pollution. His results may be found in the story MAFES Water Quality Research Protects Environment.

During this traditional season of harvesting, MAFES is thankful for support we receive from the citizens of Mississippi and our elected officials. As always, we invite you to come see us at Mississippi State University and any of our branch experiment stations.

Vance H. Watson
Director

East Mississippi Reels in Catfish

by Rebekah Ray

For years the Mississippi Delta has been known for production of both cotton and farm-raised catfish, but now catfish is swimming in east Mississippi ponds as producers are beginning to realize its economic potential.

No longer considered just Southern fare, catfish is the fifth most popular fish in America. In 1998, catfish was one of the five top agricultural commodities in Mississippi and had a value-added production of more than $306 million, up 15 percent from 1997. Mississippi's 420 catfish farms produce 65 percent of the country's catfish. Of the nation's 170,000 acres of catfish production ponds, Mississippi has 105,000 acres, with 10,000 acres located in eastern Mississippi.

For the last 10 years, production of this valuable commodity has taken hold in several counties in east Mississippi's Blackland Prairie, an arc-shaped band of fertile rolling hills that curves from Tupelo to Columbus to Macon and into western Alabama. Mississippi catfish aquaculture now flows through Monroe, Chickasaw, Clay, Lowndes, Noxubee and Kemper counties.

"The development of the catfish industry in east Mississippi is really exciting. Production there has evolved so quickly that its growth is possibly one of the fastest in the country. East Mississippi producers are very excited about its potential," said Ed Robinson, MAFES fisheries biologist and coordinator of the Thad Cochran National Warmwater Aquaculture Center (NWAC) in Stoneville.

The establishment of the NWAC at the Delta Branch Experiment Station in 1998 validated Mississippi's role as a major producer of farm-raised catfish (see "Aquaculture Center Honors Cochran," *Highlights* 61:4). The center is a cooperative effort of MAFES, the USDA Agricultural Research Service, MSU's College of Veterinary Medicine and the MSU Extension Service.

To address the distinct problems of Black Belt catfish producers, MAFES established the Eastern Research Unit of the NWAC this summer on MSU's South Farm. Additionally, an aquaculture extension specialist is housed at the MAFES Black Belt Branch Experiment Station in Brooksville and provides area catfish producers with valuable information. Catfish producers in eastern Mississippi also benefit from close proximity to MSU's College of Veterinary Medicine.

"The three units really complement each other and help all Mississippi catfish producers," Robinson said.
Catfish production began in the Mississippi Delta 30 years ago when cotton prices dropped and producers began looking for other economically viable uses for their lands. In the late 1980s, eastern Mississippi producers faced an agricultural crisis and began diversifying their crop production. The success of catfish production in both the Mississippi Delta and in hilly western Alabama lured them into the industry.

"One reason east Mississippi catfish production has grown so quickly is the already-existing infrastructure in the state," said John Hargreaves, MAFES aquaculture researcher.

Production in both the Delta and the Black Belt uses similar techniques, but several characteristics differentiate East Mississippi aquaculture from those in the Delta: soil content, topography and pond conditions.

- High-calcium soils in the Black Belt have a low sand content, which is desirable for pond construction. Delta soils have high levels of clay, which aid in retaining water.
- Since the hilly topography in eastern Mississippi is not as suitable for levee ponds as flat Delta land, ponds in the Black Belt are constructed into the landscape. Built across the slope of the land, many ponds are enclosed on one to three sides with levees. They are actually a hybrid between a watershed and a levee pond.
- East Mississippi's numerous streams supply water for catfish ponds but it must be screened to remove microorganisms and debris. Delta ponds are supplied with ground water. Hill ponds may be 10 to 15 feet deep due to topographic variations, while the average depth of Delta

ponds is about five feet.

In the Blackland Prairie, catfish may be one of several commodities produced on a farm. Producers may farm catfish full-time, produce row crops with catfish, or work full-time at other jobs and farm part-time. East Mississippi catfish farms average about 60 acres and are family-owned and operated. Delta catfish are grown on larger farms that average about 200 to 250 acres.

Despite regional differences, catfish production is contributing greatly to local economies.

"The industry has led to a lot of side businesses in the state. Everything for catfish production from beginning to the end is done within Mississippi. Producers can purchase fingerlings, feed and other supplies such as aerators, and then have their fish processed in Mississippi," said Robinson. "Right now, catfish is a good commodity, because feed prices are good and fish prices are high."

Mississippi has 14 processing plants, with four in the Black Belt: Pride of the South Catfish in Brooksville; Superior Fish Products in Macon; Prime Line Catfish in Scooba; and Fast Catfish north of West Point.

"Having local processing plants has helped greatly with the industry's development in east Mississippi since they process primarily east Mississippi catfish and are conveniently located," said Jeff Terhune, MAFES fisheries biologist.

For instance, Pride of the South opened its doors about the same time the Brooksville industry was taking off and gave producers a local market for their catfish, Terhune said.

"Catfish production in east Mississippi is increasing so fast that it is outgrowing processing facilities. As ponds are added, more processing facilities spring up so that more fish can be processed locally, which adds to local economies," said Terhune.

Catfish producers in the Delta and Black Belt face many problems unique to their respective regions, but they also share many of the same problems.

"Regardless of location, producers have problems with diseases, off-flavor and bird depredation," Hargreaves said.

Economics of Catfish Production in the Black Belt

by Ben Posadas, MAFES marine economist

Catfish enterprises in the Black Belt differ vastly from farms in the Delta in terms of farm size, pond design, water supply, diversification and support facilities. Economic studies on catfish production in the Mississippi Delta and western Alabama cannot be applied with confidence in Mississippi's Black Belt area. As catfish production continues to expand outside the Delta, the need for more area-specific economic information becomes critical.

A survey of 15 Mississippi Black Belt farms revealed that catfish production occurs generally on highly diversified, or multi-enterprise family farms that produced catfish and corn, soybeans, cotton, wheat or livestock. Farms averaged 581 acres, with about 15 percent of the total acreage devoted

to catfish.

The average farm had six eight-acre ponds. Ponds averaged four feet deep on one end and seven feet deep on the other end. The size, shape, depth and location of the ponds varied from one farm to another, depending on the topography of the land. Ponds were built either as a single pond with all four levees or as a set of two, three or four ponds sharing some common levees. Due to the high cost of constructing deep wells, catfish farmers primarily relied on surface runoff for water.

Fish farmers stocked their ponds once a year with 5,700 six-inch catfish fingerlings per acre and fed at a rate of 3 percent of the body weight. The average feed conversion ratio was 1.8 for all 15 farms surveyed. A contract crew generally harvested fish once or twice each year. The reported average yield of all 15 farms in 1995 was 5,200 pounds per acre. The farmer himself or another family member performed most tasks on these farms.

The total initial investment on a 48-acre Black Belt area catfish farm was $169,311 or $28,219 per eight water-acre ponds. Total cost amounted to $146,912 per year, $24,485 per pond or 58.86 cents per pound of catfish harvested. Catfish farmers in the area have to contend with delays in catfish sales either due to lack of processing demand or off-flavor in fish.

Catfish production in a multi-enterprise farm in the Mississippi Black Belt is a profitable enterprise. According to 1995 farm-gate prices and production costs, the optimal enterprise mix is six catfish ponds, four swine houses and 438 acres of soybeans. The whole farm net returns above specified costs amounted to $27,297 per year. Changes in cost structure, farm-gate prices and availability of operating capital would affect the optimal mix of enterprises.

Catfish Production Acreage Determination Through GPS/GIS

by Terrill R. Hanson, MAFES agricultural economist

Through MAFES and Mississippi State University, the Advanced Spatial Technologies for Agriculture (ASTA) Project is funding several in-progress research initiatives, including one on catfish acreage. For other ASTA projects, please see pages 8-11.

Technologies such as remote sensing, geographic information systems (GIS) and global positioning systems (GPS) can help researchers define catfish industry infrastructure, identify potential expansion and suggest cost-cutting measures.

These technologies can be used for a variety of purposes: to more accurately determine current catfish pond acreage in eastern Mississippi and the Delta; to project future catfish production acreage in these regions; and to reduce processor, supplier and farmer transportation costs by helping to optimally locate processing, feed mill and fingerling operations.

The majority of U.S. catfish production comes from the Mississippi Delta, where there are more than 105,000 acres for food size catfish production. Pond acreage is increasing due to low feed prices, low returns to alternative row crops, and increased demand for catfish products. Eastern Mississippi is the fastest-growing area for catfish production in the U.S. Production in that region is increasing so quickly that traditional means to account for new acreage may not be adequate.

Based on past surveys, catfish acreage in eastern Mississippi before 1990 was less than 1,000 acres and has since increased nine times this amount. An MSU Extension survey in January 1998 determined that there were 7,500 acres committed to catfish production. The acreage is estimated to have grown to approximately 9,000 acres in 1999.

However, the Mississippi Agricultural Statistics Service estimates 5,800 acres of catfish production in eastern region of Mississippi. Such a discrepancy in reported catfish acreage could lead industry support businesses (processing, feed, fingerlings, aeration, etc) to make inaccurate decisions when determining location sites and capacities.

Researchers will use high-altitude, fly-over photographs and imaging software to estimate regional pond acreage. Future catfish acreage expansion estimates will be possible by overlaying information -- such as topographic soil maps, water sources, input supply sources and existing land uses -- onto satellite images.

Physical location of farms and distances to catfish processing plants affect overall production and processing costs. Images that detail locations of production ponds in relation to the locations of input and processing facilities will enable researchers to develop a set of preferred site locations that could minimize transportation costs. Development of an economic transportation/distribution model would help farmers, suppliers and processing plants to optimally determine future expansion locations.

Ground "truthing" of the results will be required on some ponds to verify their production category -- fingerlings, broodstock or grow-out. Also, fly-over pond acreage will be checked against GPS and pond owners' acreage estimations.

This research should result in good catfish acreage estimation methods, and it can help develop a model to facilitate estimates of future catfish production and distribution efficiency.

MAFES Fishin' for Improved Cat

by Rebekah Ray

Catfish is one of Mississippi's top five agricultural commodities, and a MAFES scientist is researching ways to increase its production.

As a relatively new and growing industry in east Mississippi, catfish has emerged as a viable economic entity in the hilly Blackland Prairie area of the state. For the last 10 years, east Mississippi production has been primarily in Kemper, Noxubee, Lowndes, Clay, Monroe and Chickasaw counties.

"My research is investigating ways to increase reproduction so Mississippi producers can have higher yields from each spawning event," said Anita Kelly, MAFES fisheries biologist.

Most farms have been stocking their ponds with channel catfish due to its hardiness, captive spawning ease and flavor. Many producers are now considering the potential of the blue catfish because of its more rapid growth and resistance to enteric septicemia. Blues are larger and have

more meat, have smaller heads and have a higher dress-out, or edible percentage. Crossing these traits with the relatively quick growth of the channel catfish yields a better product.

"Getting the two species to spawn naturally is difficult, time-consuming, expensive and not very effective. I'm looking for easier methods to breed the two. Developing a more effective technique to cross the two would help increase production in the Blackland Prairie area," Kelly said.

Since producers have been getting a 30 to 50 percent average success rate with spawning, they are having to stock more brood fish to get fingerlings, which means they need larger holding areas and are using more feed, Kelly said.

Kelly is investigating several avenues to increase the spawning rates, such as implanting brood stock with hormone gonadatropins to encourage spawning. She is also researching hormone levels and studying different reproductive strategies.

"We tested hormone implants in fish this spring, but the longer, cooler spring weather caused greater spawning naturally, which interfered with our research efforts," Kelly said.

This research is still in its infancy, but it shows great promise in helping further Mississippi catfish production, Kelly said.

ASTA Research Blasts Off

by Rebekah Ray

MAFES is developing new ways of applying space-age technologies to Mississippi agriculture through the Advanced Spatial Technologies for Agriculture (ASTA) and the Remote Sensing Technologies Center (RSTC) at Mississippi State University.

More than 50 MAFES, MSU and U.S. Department of Agriculture researchers gathered for the second ASTA tour July 15-16. In its third year of funding, the ASTA is comprised of 26 research initiatives this year, up from eight initial projects in 1997. The recently formed RSTC, which is affiliated with ASTA, co-hosted the tour, and highlighted several of its projects.

"The tour helps researchers and admisistrators focus on problems and solutions. It promotes communication among scientists dealing with similar issues but who work in different locations. It sparks new ideas," said David Laughlin, MAFES agricultural economist and organizer of the tour.

In 1999, ASTA research is funded by a $1 million grant from USDA.

"Site-specific management and remote sensing are showing production agriculture in a completely different way by providing research that lets us apply agricultural chemicals more precisely, monitor crop stress and yields and improve the economic and environmental aspects of production," said David Shaw, RSTC director and MAFES researcher.

Research at MSU has been divided into five areas: soil fertility, pest management, agricultural and biological engineering, natural resources and environmental economics. Following are descriptions of several research projects in progress.

Soil Fertility

Geostatistical Analysis and Mapping of Spatial Variability of Factors. (J. White) Several MAFES researchers at the Pontotoc unit of North Mississippi Research and Extension Center are using precision management technologies to characterize the spatial variability of weeds, crop yields, insect pests and diseases, and soil chemical and physical properties.

Soil Spatial Variability on Sweetpotato Yield and Quality. (J. White) The sweetpotato is an increasingly important high-value crop in northeast Mississippi.

Since market values of sweetpotatoes differ greatly, profitability depends largely on yield. Sweetpotatoes are a notoriously variable crop, and some of the variability probably comes from the heterogeneity of the soils. Growers report better yields and higher-quality potatoes in some areas than in others.

Potassium, phosphorus, zinc, copper and manganese are important nutrients in sweetpotato production. MAFES researchers are using global positioning system (GPS) technology to examine acreage near the Pontotoc Ridge-Flatwoods Branch Experiment Station to determine chemical and physical properties that would affect sweetpotato growth, yield and quality.

Physical and Chemical Properties of Alluvial Soils and Their Relationship to Cotton Yield and Variable Rate Technology. (F.D. Whisler) Soil physical, hydrological and chemical properties vary in Delta soils, especially near stream banks.

Several MAFES researchers are investigating the use of spatial variability to map blocks of fields that are near streams. Their findings may reduce chemical and water applications to improve agricultural production and reduce producer expenses.

Soil Chemical and Physical Properties and Their Influence on Soybean Yield in Mississippi. (M.S. Cox) MAFES research is investigating how GPS and geographic informational system (GIS) technology can gather, store and manipulate site-specific, within-field management information such as yield, soil chemical and physical properties and weed populations to determine how these factors affect soybean production. From this research, producers can make better informed, site-specific management decisions than current management permits.

Physical and Chemical Properties of Alluvial Soils and the Relationship to Cotton Yield and Variable Rate Technology. (J.J. Varco) Equipment to vary fertilizer nitrogen (N) rates across fields is available, but information to assist with proper applications to optimize N is lacking. Researchers are looking at the relationship between spatial variability in soil properties and available N to determine how spatial variability in soil properties affects cotton growth and yield.

Pest Management

Spatial Technologies and Precision Farming Improve Monitoring and Management of Agricultural Pests. (S. Stewart) Each year, the management and control of insect pests in row crops is enormous. Several researchers are using GPS and remote sensing imagery to map agricultural systems on both spatial and temporal scales. Imagery has already proven its usefulness in

delineating fields into strata to show crop conditions and the possible presence of insects. Spatial technology can provide opportunities to design more efficient and precise sampling treatments for insects.

Agricultural and Biological Engineering

GPS Wastewater Tracking System for Commercial Swine Production. (T.N. Burcham) Applying swine lagoon effluent to crops is an effective use of animal waste but causes concern among local residents. A major problem associated with land application is that swine producers keep their own records, with no third-party monitoring process. Researchers have mounted receiver and data collection equipment onto a traveling gun to track swine waste applications using GPS and GIS.

Advanced Yield Monitor for Cotton and Grains. (F. To) Reliable yield monitoring for cotton has still not been obtained since it is difficult to establish and maintain calibration of optical yield monitor technology. Researchers are continuing to fine-tune their development of non-optical, non-intrusive sensor technology for determining yield in cotton harvesting.

FTIR and UV/Vis/NIR Spectrometry for Characterizing Agricultural Material Properties. (J.A. Thomason) In precision farming, sensors provide real-time decision-support information on soil and plant properties for spatially variable farm management techniques. Sensory tools allow for collection of large amounts of data to make optical reflectance and transmittance measurements quickly and easily.

Fourier Transform Infrared Spectrometers (FTIR) determine chemical identity in samples. Visible (Vis) and near-infrared (NIR) light can then provide valuable information on agricultural materials, but other portions of the electromagnetic spectrum like ultra-violet (UV) light offer additional sensing possibilities.

MAFES researchers are using UV/Vis/NIR and FTIR to collect broad-spectrum reflectance and transmittance data of many agricultural materials for precision farming research.

Low-Cost, Site-Specific Fertilizer Spreader. (F. To) Variable-rate technology may seem cost-prohibitive for many smaller producers, but MAFES is looking for ways to make the technology more accessible to more producers. Researchers are developing an off-the shelf, add-on, low-cost, traditional fertilizer applicator for site-specific application.

Natural Resources

Assessing Potential Fecal Coliform Inputs to Nearshore Waters. (C.Z. Holloman) During harvesting season along the Mississippi Gulf Coast, oyster reefs may close from elevated levels of fecal coliform bacteria in the water.

Fecal coliform is a naturally occurring bacterium in the intestines of mammals and is present in concentrated amounts in untreated or improperly treated sewage effluents. Health and natural resource agencies use the presence of fecal coliform as an indicator of water quality. Failing septic systems are major sources of sewage effluent entering coastal waters. MAFES researchers are using remote sensing to determine the presence and levels of fecal coliform in water and to detect contamination to a water body from failing septic tanks.

Thematic Imagery for Delineating and Mapping Wetland Habitat Types. (C.Z. Holloman)
Unprecedented growth on the Mississippi Gulf Coast is infringing on natural resources that are vital to local economies. Responsible resource management decisions balance economic development with environmental preservation.
Destruction or alteration of wetland habitats is a concern on the Mississippi Coast. Maintenance and preservation of wetland habitats is critical to Mississippi's commercial fisheries and tourism, as is maintaining the aesthetic characteristics of the coast.

MAFES is using remote sensing to develop a digitalized map of Hancock County to delineate locations and classifications of wetlands and upland habitats and then groundtruth each habitat for accuracy of signature recognition.

Environmental Economics

Advanced Spatial Technology to Reduce Agricultural Non-Point-Source Pollution. (D.H. Hite)
Precision application technologies are helpful in reducing "non-point-source pollution" in agriculture. Non-point-source pollution comes from a large number of indirect small sources, such as agricultural runoff. Pollution in which a large amount comes from one source, like a paper mill, is referred to as "point-source pollution."

MAFES researchers are using precision technologies to better determine non-point source pollution.

Through these varied research projects, MAFES is finding different ways to use satellite technology to improve Mississippi agriculture.

MAFES Shows Off Research At Field Days

by Rebekah Ray

Warm weather provides opportune times for several of the 16 MAFES research centers to show off their research through field days and garden days.

Verona Holds Spring Garden Day

Cool spring temperatures welcomed gardening enthusiasts to the 3rd annual Spring Garden Day at

the North Mississippi Research and Extension Center (NMREC in Verona on May 22. About 500 gardeners attended the event to learn more about gardening techniques and to meet with MAFES and MSU Extension Service personnel.

"This event is great for gardeners in our area of the state. We hope the information is helpful to them and that they pick up lots of good ideas to use in their personal gardens," said NMREC director Dickie Rhea.
Tours included exhibits on irrigation methods, plant propagation, and growing strawberries, roses, and vegetables. Morning seminars addressed transplanting techniques, square foot gardening, flower arranging and colorizing home landscapes

The exhibit tent provided information on the master gardener program, organic gardening, butterfly gardening, soil pH testing, animal control, medicinal herbs and plant identification, and featured "Plant Doctors" Frank Killebrew and James Jarra tt, MSU Extension specialists.

The Tupelo Garden Club offered a plant swap as part of the activities.

Poplarville Shows Off Gardens

Gardeners and producers from south Mississippi visited the first trial garden open house at the June 11 at the South Mississippi Branch Experiment Station in Poplarville.

Beds showcased the Mississippi Medallion trial garden, vegetatively propagated petunias, an herb garden, an exhibition garden of more than 60 different butterfly bushes and conventional bedding plants like impatiens, lantana, salvia, sunflowers, coleus, g eraniums and vinca.
About 125 nurserymen and "green industry" suppliers from south Mississippi and south Louisiana attended the event.

Dairy Field Day Hosted in Newton

About 120 dairy producers headed to the Coastal Plains Branch Experiment Station in Newton for the May 27 Dairy Field Day to learn production updates from MAFES and MSU Extension personnel.

Sessions covered postpartum recovery and fertility, federal order reform, dietary organic trace mineral supplementation for lactating cows, Holstein performance on ryegrass pastures and milk production from ryegrass.

The annual event rotates among the North Mississippi Branch in Holly Springs, Bearden Research Center at Mississippi State and Coastal Plains to make sessions more accessible to producers. Dairy production involves a twice-daily milking schedule that hind ers producers from traveling far from their herds.

Two-thirds of the state's 365 dairy farms are located in the New Orleans milkshed, counties south of I-20 that tie into Louisiana's dairy production parishes. Additionally, a large quantity of Mississippi milk passes through milk processing plants in Mobile and Montgomery, said Joey Murphey, superintendent of the Coastal Plains Branch.

Hot Weather A Part of Rice and Soybean Day

Almost record-high temperatures met more than 250 producers, suppliers and researchers at the annual Rice and Soybean Field Day at Stoneville on Aug. 12.

Participants toured rice and soybean field sites, where researchers presented developments on rice weed control, performance of soybean varieties, soybean weed control, rice insect control and comparisons of new releases of rice varieties.

"We had an extremely good turn-out especially considering the current hot weather," said James Smith, director of the Delta Research and Extension Center.

A tradition of Stoneville's field days is a (Mississippi Delta) "fried catfish-with-all-the-fixin's" lunch served under the trees.

Heat Doesn't Faze Cotton, Producers

Hot weather and cotton go together naturally, so the more than 150 cotton producers, agricultural suppliers and scientists seemed to feel at home at the Cotton Field Day at the Delta Research and Extension Center in Stoneville.

MAFES researchers and USDA Agricultural Research Service scientists presented a variety of research projects to help Mississippi cotton production. Topics included harvester developments for ultra-narrow-row (UNR) cotton, irrigation effects, variety trial s, insecticide trial results, evaluation of early planting dates and agronomic evaluation of UNR systems.

"We're glad consultants come because they're the ones who pass this information on to farmers. They help keep producers informed of our research," said Jody Stovall, field day coordinator.

In addition to visiting 10 cotton field research sites, participants examined new harvesting and production equipment and saw exhibits on weather and global information systems.

Brown Loam Hosts First Hay Day

Rain greeted the 120 producers and suppliers from around the state at Brown LoamÕs first Hay Day on June 26.
"The day went really well, despite the rain, and provided an opportunity for producers to learn about hay management, cutting quality and gathering good hay," said Gregg Smith, superintendent of the Brown Loam Station in Raymond.

Presentations included establishing and maintaining improved bermudagrass, owning hay equipment, appraising hay values, and tips on hay sprigging. Equipment demonstrations were provided by Ford New Holland, New Idea, Vermeer, Kuhn, BASF and Vicon.

"Interest was very high on the emphasis of hay production and plans are underway for next year's hay day at Brown Loam." Smith said.

Brown Loam Addresses Field Crop Issues

At this summer's second field day Brown Loam hosted the annual Field Crops Research and Extension Day on Aug. 26. More than 75 attended, including 15 producers.

Mississippi State researchers addressed Mississippi cotton, corn, and soybean production; variety evaluations; crop response to Roundup applications; and soybean weed control.

"Central Mississippi producers benefit from longer growing seasons. The crops presented here were to help primarily central Mississippi producers increase their yields on brown loam soil," said Gregg Smith, Brown Loam Branch Station superintende nt.

Lunch was sponsored by Agro Distribution, Cyanamid, Monsanto, UAP Midsouth and Zeneca Ag Products.

The afternoon session included an update on agricultural disaster aid and crop insurance programs by MAFES agricultural economist Barry Barnett.

MAFES Water Quality Research Protects Environment

by Rebekah Ray

The United States leads the world in production of agricultural crops, a position it holds in part because of this country's development and optimization of agricultural chemicals like fertilizers, herbicides and pesticides.

Yet, overuse of these treatments may harm the environment. When excess chemicals run off and permeate other elements of the environment, MAFES weed scientist David Shaw steps in.

"Our research focused on surface water quality, chemical runoffs and the damage caused by over-application of agricultural chemicals. We monitor where pesticide runoff goes and what happened to it," Shaw said.

Shaw worked closely with MSU soil scientist William Kingery and graduate students Al Rankins, Marty Schraer, Simone Seifert and Mark Shankle. The team investigated the cotton herbicides fluometuron and cyanazine and the soybean herbicides imazaquin and metolachler.

Fluometuron. Fluometuron controls broadleaf weeds and grasses. The chemical can be applied preemergence, before planting or after targeted crops and weeds come up. The herbicide has residual action of two to five months. It is biodegradable in soil, with a half-life of about 85 days and has the potential to move into groundwater and surface water .

Cyanazine. Cyanazine is a pre- and post-emergent herbicide used to control annual grasses and broadleaf weeds on cotton, corn, sorghum and wheat. The Environmental Protection Agency restricted use of the chemical to only certified applicators. Cyanazine is transported by runoff, sediment and water and can leach through to groundwater. In many soils, microbial activity quickly breaks the herbicide down.

Imazaquin. A selective pre- and post-emergent herbicide, imazaquin is a low-toxicity general pesticide used to control grasses and broad-leafed weeds in soybeans, turf and ornamentals. Soil microbes break down imazaquin.

Metolachlor. Metolachlor is a preemergence herbicide used for grass and broadleaf weed control in soybeans, cotton and corn. Numerous detections have been found in surface water and significant quantities of it have been detected in the upper and lower Mississippi River.

Shaw investigated how soils hold herbicides, how various best management practices affect chemical runoffs into surface water and how frequently these chemicals occur in surface water in Mississippi.

Water Quality Monitoring. For the past two years, samples from streams and rivers throughout the Mississippi Delta were collected to determine concentrations of key herbicides such as metolachlor and cyanazine. This involved close work with the U.S. Geological Survey in Jackson, Miss.

Many of the samples taken during June contained detectable quantities of at least one herbicide. During May and June, intensive agricultural production occurs, including heavy applications of herbicides. Very few samples contained more than the allowable limits for drinking water, and the few elevations that did occur were transient.

Riparian Zones. Throughout the Mississippi Delta, similar areas go by many different names, such as sloughs, wetlands or old-growth forests. For generations, these wetland areas have been viewed as wildlife habitats, but as demands for crop yields have increased, the lands are being drained and converted to production land.

Shaw demonstrated the value of maintaining these wetlands, or riparian areas, for trapping and processing agricultural chemicals. Soils in these areas are rich in organic matter and microbial populations that can quickly adsorb nutrients and pesticides, and then metabolize them to non-toxic forms.

Riparian soil adsorbs over four times more fluometuron than cropped soil. The half-life of fluometuron in a cotton field can be as much as 120 days, yet in a riparian soil, its half-life can be as little as 12 days. These vast differences have the potential to preserve water quality in the Mississippi Delta without forcing dramatic changes in current production systems.

Using natural riparian zones to their fullest potential can be a key in maintaining the usability of some of the more preferred and effective agricultural chemicals.

Grass Filter Strips. Grass strips planted at intervals in the fields or at field edges are effective

filters to extract pesticide runoffs from adjoining fields. Shaw tested the filtering effectiveness of several grasses, including tall fescue, switchgrass, eastern gamagrass, big bluestem and giant reed to provide producers with some flexibility in filter selection.

Tall fescue, *Festuca arundinacea,* tends to grow dense but low. As a forage, it is easy to establish, but as a filter, it is not always effective because of its texture. During heavy rains or when under much water, the softer nature of this grass allows water to inundate the filter strip, so that as water flows over it, reducing its effectiveness.

Switchgrass, *Panicum virgatum,* is a perennial native to the Great Plains. Hardy in Zones 5, 6, 7, 8 and 9, the grass has flowering stalks that are stiff and erect, growing three to six feet tall. It grows well in a variety of soil conditions: sandy or clay, wet or well drained, acid or alkaline, and in drought or heavy moisture.

The research also revealed a disparity. Herbicides are intended to destroy weeds or any other plants not in a desirable location. Usage of herbicides could also destroy plants intended to filter chemical runoff, so researchers analyzed various selected grasses to better match grasses and herbicides.

Since filter strips grow either in the field or at its edge, an accidental direct application or drift of herbicides applied to the crop can easily occur. Such unintentional applications could damage the effectiveness of the strips, minimize their benefits and discourage their acceptance.

Of the filter strip grasses tested, eastern gamagrass, *Tripsacum dactyloides L.*, was the most effective in filtering out agricultural chemicals, but it was also the most sensitive to post-emergence herbicides that might accidentally cross the filter strip. These included herbicides such as glyphosate, fluazitop, sethoxydim and imazaquin. While the grasses were not completely killed, they were injured substantially, their vegetative growth was reduced and their filtering abilities were depleted.

Big bluestem, *andropogon gerardii,* is another tall, erect prairie grass. Shaw found that it could be quite effective as a filter strip but was one of the more difficult species to establish, so it may have limited potential for use in Mississippi.

Giant reed grass, *Arundo donax,* is similar in appearance to bamboo. Used for decorating, it is also an effective filter, but grows so tall it can shade crops. Additionally, it is almost impossible to obliterate, making it ill-suited for use as a filter. MAFES researchers destroyed some test plots by using a backhoe to clear out the roots.

MAFES knows the need for safeguarding the environment and Shaw's water quality research helps ensure its protection.

Filter Strips Aid Water Quality

By Bonnie Coblentz

Numerous Mississippi farmers are planting vegetation buffer strips between cropland and waterways to improve water quality and fight erosion.

Larry Oldham, Mississippi State University soil scientist, defines buffer strips are narrow strips of grass or trees between cropland and surface waters that slow the water coming off cropland.

"By slowing the water, they allow nutrients such as nitrogen and phosphorus to settle out and not get into the water," Oldham said. "In row crop areas, buffer strips have been shown to lower pesticide movement to streams and lakes. They also can decrease sediment movement to water. Too much sediment restricts stream flow and can lead to more frequent flooding."

If allowed to wash off farmland into water sources, nutrients could promote rapid growth of undesirable microscopic organisms. These can lead to decreased water quality and the loss of desirable organisms.

"By keeping the nutrients out of the water, we can restrict growth of undesirable algae and maintain water quality," Oldham said.

Dudley Waldrop said Waldrop Farms in Oktibbeha County, of which he is a partner, continuously battled with silt deposits and erosion from heavy rains and the overflow of a creek through his property. In 1996 after an especially devastating spring rainy season, he installed filter strips on his 1,700 acres of row cropland.

"It's the best thing we've ever done on this farm," Waldrop said. "Since then, we have had overflows from the canals and heavy enough rains that we can see these filter strips have really protected the soils and cut our erosion down to a minimal amount."

Trim Cane Creek runs along one side of Waldrop Farms, and hills edge another side. In heavy rain, not only does the creek overflow, but the water flowing off the hills adds to the problem. Topsoil is washed off the cropland, and the canals and ditches fill with silt and topsoil.

"The filter strips slow the water as it jumps out of the ditches and the canals and lets the silt deposit in the filter strips rather than in the fields," Waldrop said. "By slowing the water, we don't have near the surface erosion or silt deposits in our drainage ditches that we used to have."

Waldrop Farms has 40 acres of filter strips planted in fescue. All are enrolled in the Conservation Reserve Program.

Terry Myers, district conservationist with the National Resource Conservation Service in Calhoun County, said filter strips became part of the CRP program in 1997.

"It's not a hard sell to get people to plant filter strips, and in the last month, the number of applications tripled," Myers said. "With the pine timber prices so good now, all my Calhoun County folks are wanting trees. In addition to the 15-year payments, they can harvest the trees."

In Calhoun County, about 90 farmers are using filter strips enrolled in the CRP program, which pays from $45 to $72 per acre, depending on the soil type. CRP contracts can last for 15 years, and pay an additional $34 per acre one-time fee if trees are planted. Vegetative strips with trees can be 150

feet wide, compared to 100 feet wide if grass is planted.

Of all the programs we have to offer for farmers and the environment, the buffers are by far the best we have not only for the land, water quality and wildlife, but also from an economic standpoint for the farmer," Myers said.

MAFES And MSU-ES Study Use of Poultry Litter

by Bonnie Coblentz

MAFES, the MSU Extension Service and the USDA Agricultural Research Service have joined efforts to research acceptable uses of chicken litter.

Larry Oldham, MSU Extension Service soil specialist, said land application of animal manures is one of the most important issues facing American agriculture.

"In the southeast United States, broiler production is geographically concentrated in small areas around processing plants," Oldham said. "In Mississippi, broiler litter is a mixture of waste and wood shavings, and is commonly used as a fertilizer for forages and pastures. After many years of litter application to pastures, soil test phosphorus levels have apparently increased."

"Soil phosphorus is attached closely to soil particles and traditionally has not been thought to move unless there is erosion," Oldham said. "Recent scientific evidence indicates that in high soil phosphorus situations there may be movement of soluble phosphorus not attached to soil particles."

For the environment, this means that phosphorus may end up in streams and lakes, promoting the growth of undesirable plants and algae.

"We want to demonstrate best management practices that store phosphorus and reduce its likelihood of moving off the field," Oldham said. "We also want to develop management systems that maximize the plant use of litter sources of phosphorus."

Working with MAFES agricultural economist Diane Hite and MAFES agronomist Billy Kingery, Oldham received a grant from USDA-Cooperative State Research, Extension and Education System. This money was coupled with special research initiatives from the state legislature through MAFES.

The funds will be used to establish an experiment at the MAFES Coastal Plain Experiment Station in Newton to evaluate grazing and forage management systems' effect on runoff water quality. A pasture is being divided into small watersheds where cattle will graze, simulating real-life situations farmers face.

Joey Murphey, superintendent of the Coastal Plain Experiment Station, said 12 paddocks will be constructed this fall, each two acres in size. Twenty-seven steers will graze nine of these, while the remaining three will be used for hay production. Murphey said two plot experiments have been started, and others are planned for the fall. Water quality runoff studies will be conducted in each of the paddocks.

"We've got a yield plot where we're measuring bermudagrass yield treated with various rates of poultry litter," Murphey said. "An adjacent plot is testing poultry litter, commercial fertilizer and a combination of both."

Geoff Brink, USDA-Agricultural Research Service agronomist, said the work is divided into three phases. Results from the test plots at Newton will be compared to similar soil on a poultry producer's farm in Mize that has received poultry litter for about 25 years.

"We began treatments this year to look at different forage and litter management practices that will affect fertility levels of the soils," Brink said. "Our objectives are to assist the poultry producer in reducing the accumulation of nutrients in the soils and also to examine how different litter management practices affect plant nutrient uptake."

The grazing experiment is practical because poultry and cattle production are closely linked. Poultry litter is an excellent fertilizer for forage used to feed cattle.

"We want to look at practices that involve cattle and learn how they affect soil nutrient levels and how they might impact nutrient runoff from the field," Brink said.

A future phase will look at poultry production's impact on the water quality of an entire watershed.

Hite is studying ways to avoid overapplying poultry litter in an area. She is also looking at economical transportation of the litter and the environmental benefits of it leaving the area.

"Farmers in other parts of the state should be willing to pay to receive this litter," Hite said. "In addition to offering nutrient value and serving as a good soil amendment, transporting it out of the area would avoid pollution by overapplication."

MSU Hosts 80th Ag History Symposium

by Errol Castens,
Northeast Daily Journal

Many Mississippians are a generation or two or three removed from the farm, but most still know where their roots are.

It's keeping those roots in mind that energizes the Agricultural History Society, which held its 80th annual symposium June 17-19 at Mississippi State University. Most years the symposium centers on a particular area of farm and rural history, but this year's theme, "Eighty Years of Agriculture and Agricultural History," covered a myriad of topics with many presenting sociological influences of agriculture.

The presenters -- most of them academicians -- addressed facets of agricultural history as diverse as the New Deal's role in avoiding rural rebellion in the 1930s, the survival of cotton as a major crop, migration of blacks out of the South and rural electrification.

"Things don't just happen. They happen in response to other events and pressures in society. Most farm programs were created in response to a true economic crisis. Knowing why things happened gives us a better perspective for guiding those same institutions and handling similar pressures today," said MAFES agricultural economist John Lee.

One session tied together several trends that took root during the 1930s.

Midwest agrarians and Eastern urban liberals allied themselves in Franklin Roosevelt's administration, said Jess Gilbert of the University of Wisconsin-Madison. One group was trying to save the landowner, while the other determined to save the tenant farmer. Described as "a plague of lawyers (that) descended on Washington," their combined efforts drastically changed the face of farm and rural life across America.

New Deal efforts to improve black tenant farmers' lives were described in a book by Arthur Raper, a member of the Roosevelt administration, as "an Exodus without a Moses."

Mary Summers of Yale University showed how conservative Southern legislators, led by Mississippian Jamie Whitten, kept Roosevelt's policy changes from being even more radical than they were, and Lawrence Nelson of the University of North Alabama tied the rise of the National Cotton Council to the eventual salvaging of cotton as an economically viable crop. The National Cotton Council was organized in the lobby of the Peabody Hotel in Memphis.

Rural people and the influence of material and social progress on their lives was another focus.

Oral histories are a vital part of rural and agricultural history, said Melissa Walker of Converse College. Her specialty is using oral histories (audiotapes of now-elderly people talking about their early lives) on the Great Depression.

"You find patterns in these oral histories," Walker said. "They all talked about self-sufficiency and mutual aid. Most of them said, 'We were all in the same boat,' but some were clearly better off than others."

Oral histories tend to have many inaccuracies about details, she said, but they add their own value to research.
The symposium meets at a different site each year. It last met at MSU in 1978.

MAFES 'Pharms' With Ole Miss

by Rebekah Ray

They may be fierce competitors on the gridiron, but Mississippi State University and the University of Mississippi are seeing eye-to-eye in herbal pharmaceutical research.

Through a joint research initiative, MAFES and the Thad Cochran National Center for Natural Products Research (NCNPR) at Ole Miss are "pharming" to develop medicinal plants as emerging crops.

"This is an exciting project and is a natural area of cooperation between MAFES and the University of Mississippi's School of Pharmacy," said Rodney Foil, who was vice president of the MSU Division of Agriculture, Forestry and Veterinary Medicine when the project began.

MAFES is continually researching how production of alternative crops may increase profits for Mississippi producers.

"A highly complementary program such as this is conceivable between Mississippi State and Ole Miss. By utilizing crops identified by the Natural Products Center, MAFES has the expertise to evaluate the agronomic and economic feasibility of commercial production systems," said Marty Fuller, assistant director of MAFES.

The University of Mississippi is recognized as a leader in the study of medicinal plants. "Translating the research results from laboratory and small experiment field studies to scales of production appropriate for selected medicinal plants is the focus of our collaboration with MAFES and Alcorn State University's Small Farm Development Center," said Alice Clark, director of the NCNPR.

"We're combining the unique talents and resources at each institution for the good of Mississippi. Our research focuses on the chemistry and biology of medicinal plants that can be developed as crops. Large crop production is a strong suite of Mississippi State and we believe this will be a good alliance," Clark said.

Most of the MAFES work will be conducted at the North Mississippi Research and Extension Center (NMREC) in Verona and the Pontotoc-Flatwoods Branch Experiment Station. MAFES will develop agricultural production systems to raise plants to be studied for medicinal purposes.

"This collaborative project is still in the planning stages, but itÕs bringing together the strong suites of both Mississippi State and the University of Mississippi -- our agricultural expertise and their knowledge of medicinal plants," said Kent Cushman, MAFES horticulturist at NMREC.

The NCNPR is also working with the Small Farm Development Center at Alcorn State to examine the potential of certain medicinal plants to provide an economic boost to limited resource farmers. Medicinal plants can refer to herbal products, nutraceuticals (functional foods) or plants that are sources of pharmaceuticals.

For the past several years, companies have marketed herbal products such as garlic, St. John's wort, Echinacea, ginseng, ginkgo biloba, black cohosh and saw palmetto. The common foxglove, *Digitalis* sp., is familiar because its leaves provide the heart stimulant digitalis.

Most of the developing countries in the world continue to rely on plants for treating diseases and controlling health conditions. With the growing market for botanicals in more developed countries,

there are both opportunities and challenges in assuring that consumers and health care professionals have access to only high quality, reproducible products with proven benefits.

"Pharming is a hot topic in this country right now. Herbal medicine is catching on as Americans are becoming much more health conscious," Foil said.

Former MAFES Cotton Breeder Passes Away

by Rebekah Ray

Retired MAFES cotton breeder Robert Rhea "Bob" Bridge, 59, died May 8, 1999, after a massive heart attack at the Delta Regional Medical Center in Greenville.

Considered by many to have been the best breeder in the world, Bridge researched cotton development for 27 years at the Delta Branch Experiment Station in Stoneville.

While with MAFES, Bridge developed DES 56, DES 24, DES 422 and DES 119 varieties of cotton, which have been used in new variety development by Delta and Pine Land Co. (D&PL) and Stoneville Pedigreed Seed Company, the world's largest cotton planting seed companies. D&PL owns Sure-Grow, Deltapine Seed and Paymaster Cottonseed.

Bridge received several awards and honors for his research and work with cotton. In 1997, he was earned the Cotton Genetics Research Award. In 1988, Bridge received the Mobay Corp./Cotton Foundation Cotton Research Recognition Award. He also was named the Mississippi Agronomist of the Year in 1978. Bridge served as chair of the Beltwide Cotton Improvement Cotton Conference and authored or co-authored 125 publications.

Bridge was a former president of the Leland Lions Club. After retiring from MAFES, he joined Sure-Grow as vice president of research, where he continued researching variety improvement and development of early-maturing genotypes.

He is survived by his wife, Jean McLaughlin Bridge; a daughter, Cheryl Bridge Brown of Orlando, Fla.; a son, Robert Brent Bridge of Greenville; his mother, Charlotte VanAusdell Gruhlkey of Stillwater, Okla.; two sisters, Brenda Bridge Williams of Burleson, Texas, and Donna Bridge Weht of Stillwater; and four grandchildren.

Memorials may be made to the American Heart Association or to Leland First Baptist Church.

Past MSU Ag Researcher Heads Organization

by Rebekah Ray

A former MSU researcher now heads the U.S. Department of Agriculture's Cooperative State Research, Education and Extension Service.

Charles Laughlin assumed the position July 5, after serving as dean and director at the College of

Tropical Agriculture and Human Resources at the University of Hawaii-Manoa.

Laughlin's career has included coordinating teaching and research programs in Plant Pathology and Weed Science at Mississippi State. He has also served as associate director of the Georgia Agricultural Experiment Station, as director of the Colorado Agricultural Experiment Station, and as a teacher and researcher at Michigan State University.

Laughlin worked as a consultant to the Brazilian Ministry of Education and Culture to strengthen educational programs in agriculture. Additionally, he recruited and assigned agricultural volunteers to work in the Philippines, Thailand, Malaysia and Nepal.

CSREES links the research and education programs of the USDA with land-grant institutions like Mississippi State and other colleges of agriculture, as well as 59 agricultural experiment stations, 57 cooperative extension services, 63 schools of forestry, six 1890 historically black land-grant institutions and Tuskegee University, 27 colleges of veterinary medicine, 42 schools and colleges of human sciences, 29 1994 Native American land-grant institutions and 190 Hispanic-Serving Institutions.

Texas A&M Exec Named New MSU VP-DAFVM

by Joe Farris

A senior administrator in the Texas A&M University System has returned to Mississippi State University to serve as vice president for the university's Division of Agriculture, Forestry and Veterinary Medicine.

J. Charles Lee assumed his duties Sept. 1, following formal approval of the appointment by the Board of Trustees, Institutions of Higher Learning. Most recently, Lee served as vice chancellor for research, planning and continuing education at Texas A&M.

No stranger to Mississippi State, Lee was MSU dean of forest resources and associate director of the Mississippi Agricultural and Forestry Experiment Station 1978-83. He has held senior administrative positions at Texas A&M since then.

He succeeded R. Rodney Foil, who retired in June after 30 years as an MSU administrator, including 13 years as vice president.

"Charles Lee has a sterling record of achievement in one of the premier land-grant universities in the nation and a proven track record as a leader in scientific agriculture," said MSU President Malcolm Portera.

"He understands both the needs of our state and the potential of our university to help address those needs in areas such as biotechnology and other agriculture, natural resource and animal health disciplines," Portera added.

The vice president for agriculture, forestry and veterinary medicine oversees the MSU Extension Service, MAFES and the Forest and Wildlife Research Center. The office also shares administrative responsibility with the vice president for academic affairs for the colleges of Agriculture and Life

Sciences, Forest Resources and Veterinary Medicine.

"Mississippi State has a critical role in preparing the professional, industrial and scientific leaders of tomorrow's food and fiber industry," Lee said.

"Agricultural and natural resource agencies will need to develop and disseminate new technologies and information to assist this important segment of the Mississippi economy to maintain its competitiveness while being responsive to environmental and consumer concerns, Lee said.

"I am honored by the confidence conveyed in this appointment and very impressed by the current momentum of the university," Lee said.

In his current position since 1995, Lee was responsible for academic program development for all institutions in the A&M system, as well as for strategic analysis of policy issues facing the system.

In 1994 and 1995, he served as the university's interim executive vice president and provost. For eight years, he held various roles in the system's statewide agriculture program, including four years as the system's deputy vice chancellor of agriculture and executive associate dean of the College of Agriculture and Life Sciences.

He was professor and head of the forest science department at Texas A&M from 1983 to 1989 and also served as associate director and interim director of the Texas Agricultural Experiment Station.

Lee holds a bachelor's degree in forestry and a Ph.D. in forestry/genetics from North Carolina State University. He also has done graduate work at Duke University.

New Hires

Baird is New MAFES Plant Pathologist

MAFES plant pathologist Richard E. Baird has joined the Department of Entomology and Plant Pathology at Mississippi State, where he will continue researching corn and soybean pathogens such as charcoal rot (*Macrophomina phaseolina*).

Charcoal rot is a major problem in Mississippi soybean production. Baird is looking for ways to control the disease in the field and to identify its molecular basis. Plants infected with charcoal rot have a peppered appearance extending from the taproot to the ground surface and must be lifted to identify presence of the disease. Those infected will wither and die earlier than normal, thus reducing yield.

Baird received a B.S. in forestry management and a M.S. in forest pathology from West Virginia University. He earned his doctorate in mycology at the University of Tennessee in Knoxville.

Willard Named MAFES Dairy Reproductive Physiologist

Reproductive physiologist Scott Willard has recently joined the faculty at Mississippi State University, where he will research the reproductive performance of high-producing milk cows.

Before coming to MAFES, Willard had been a post-doctoral fellow and research assistant at the Medical University of South Carolina in Charleston, where he researched the effects of endocrine disrupters such as phytoestrogens (plant estrogens) in breast cells. At MSU, his research will explore how biotechnology can improve Mississippi's dairy production.

In 1998, Mississippi dairy production showed an estimated value of $105 million, or 13,800 pounds of milk per cow.

Willard holds a bachelor's degree in animal, veterinary and fisheries science from the University of Rhode Island, and masters and doctorate degrees in reproductive physiology from Texas A&M University.

Moore to Head NMREC

Reuben Moore has recently been named head of the North Mississippi Research and Extension Center in Verona, after serving for 11 years as an extension dairy specialist at Mississippi State.

In Extension, he was responsible for Mississippi dairy educational programs and dairy waste management research. Moore also established the annual Mississippi-Louisiana Dairy Management Conference. His research in dairy waste management included manure separation technologies and free-stall bedding materials.

"I'd like to enhance offerings at all four stations by emphasizing research and extension programs that will serve the needs of our clientele. We have a relatively new horticulture unit under Kent Cushman and Crofton Sloan and are already seeing lots in interest from the urban community in our activities, such as our Spring Garden Day each May," Moore said.

The Magnolia Botanical Garden draws lots of interest, and children like our Pizza Garden, which illustrates how various pizza ingredients are grown, Moore said.

"The oldest producer-advisor group in the state started at NMREC. This group connects commodity producers with advisors to discuss needs and concerns and helps specialists and researchers learn what issues need to be addressed," Moore said.

Moore is also administratively responsible for research programs at four branch experiment stations: Northeast Mississippi in Verona, North Mississippi in Holly Springs, Pontotoc Ridge-Flatwoods in Pontotoc and Prairie in Prairie.

Before joining MSU, Moore owned and operated a dairy farm in Philadelphia for 10 years. Moore earned a Bachelor of Science from Mississippi State, a masters in animal nutrition at the University of Tennessee in Knoxville and a doctorate in animal physiology from MSU.

Vizzier-Thaxton Joins MAFES Poultry Research

MAFES poultry pathologist Yvonne Vizzier-Thaxton has joined the poultry science faculty at Mississippi State University.

Vizzier-Thaxton will use experiences she gained through a 30-year career in the poultry industry to teach courses in feed manufacturing and commercial broiler processing. As vice president for

science and quality assurance at Marshall Durbin Food Corp., she was responsible for quality control of feed mills, hatcheries and processing plants.

In addition, Vizzier-Thaxton coordinated the company's compliance with Food and Drug Administration feed manufacturing regulations and U.S. Department of Agriculture processing regulations. She was responsible for environmental regulations set up by the Occupational Safety and Health Administration and the Environmental Protection Agency for all production operations. After leaving Marshall Durbin, she became a poultry research consultant for an allied poultry company, conducting seminars and advising on poultry research.

Vizzier-Thaxton earned a B.S. and M.S. in microbiology at Mississippi University for Women and a Ph.D. in pathology from Auburn. Her husband, Paul Thaxton, is also a MAFES poultry researcher at MSU.

Laney Morgan is the new Administrative Assistant for MAFES director Vance Watson.
