

MAFES RESEARCH

HIGHlights

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Mississippi Agricultural and Forestry Experiment Station

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from the **DIRECTOR**



If you've ever driven from Corinth on the Tennessee line to Bay St. Louis on the Gulf of Mexico, you know that our state is very diverse.

The diversity goes beyond the obvious—the rich soils and flat landscape of the Delta; the rolling, pine-covered hills of the northern coun-

ties; and the sandy beaches and shrimp-filled waters of the Gulf. Below the surface, there are 700 named soils in Mississippi and the state's vegetation grows in four different climate zones.

For more than a century, the research conducted by scientists with the agricultural and forestry experiment station has supported the agricultural and other enterprises that fill the state's landscape. Mississippi's first station was established on the Starkville campus of what was then the Agricultural and Mechanical College in 1888. Off-campus research began in 1900 at a branch station in McNeill in Pearl River County.

Today, the entire state is truly our laboratory; with MAFES research facilities at 17 locations and on-farm projects with cooperating private producers throughout the state.

Each year, many of the branches host field days, providing the public the chance to see our work firsthand. This issue of MAFES Research Highlights features our branches and their field days. We hope you've had an opportunity to visit one of these events. If not, the following pages will provide a glimpse of the people and activities that make up our statewide lab.

Vance H. Watson

Vance H. Watson
Director

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MAFES RESEARCH **HIGHlights**

MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION

Vance H. Watson Director

J. Charles Lee President

Vance H. Watson Interim Vice President
Mississippi State University

EDITOR

Ned Browning

ASSISTANT EDITOR

Robyn Hearn

GRAPHIC DESIGN & LAYOUT

Beth Dishongh

PHOTO EDITORS

Jim Lytle Marco Nicovich

WRITERS

Linda Breazeale Bonnie Coblenz

PHOTOGRAPHY

Linda Breazeale Bonnie Coblenz
Will Smith Jody Stovall
Ned Browning

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Bonnie Coblenz

4 ASTA Tour 2002 *Stoneville / Brooksville*

By Bonnie Coblenz and Ned Browning

The Remote Sensing Technologies Center (RSTC) and Advanced Spatial Technologies in Agriculture (ASTA) at Mississippi State periodically host the Precision Agriculture Tour at MSU's Starkville campus and branch stations.

The 2002 ASTA/RSTC Tour was held Sept. 10 at the Delta Research and Extension Center in Stoneville and Sept. 11 at the Black Belt Branch Experiment Station in Brooksville.

Scientists and researchers from diverse fields present and attend. Industry representatives also are invited to take part.

"The goal is to provide a networking environment in which scientists can share their studies of geospatial technologies applied to agriculture," said Chuck Hill, RSTC associate director and tour organizer. "We are planning for a farmer group to join the tour next year."

At the Delta Branch Experiment Station, field tours focused on experiments in site-specific cotton, insect and pesticide management aided by the eye of a satellite or high-flying airplane. Also, addressed in tours were weed detection and management, and ways to monitor crop maturity and cutout. Entomologists Aubrey Harris, Don Sudbrink, and Pat English and soybean agronomist Dan Poston briefed tour participants.

Scott Samson, discussing how precision agriculture can be tested on-farm, noted that decisions must be made

as to what technologies are appropriate for given applications. For instance, he noted that satellite monitors can be severely limited during the growing season by significant cloud cover. He explained that local flyovers at lower altitudes may be the answer. This in turn may lead to commercial ventures.

Extension agricultural economist Steve Martin addressed the economics of geospatial technologies. He noted that technologies need to be implemented before true cost-value analyses can be done. Studies are in development.

Catfish-oriented remote sensing was discussed by Southern Regional Aquaculture Center Head Craig Tucker and agricultural economist Terry Hanson. Tucker reported John Hargreaves' work tracking algal bloom in order to predict off-flavor in fish. Results appear not to support the idea. However, Tucker said that the technologies might be useable as an oxygen depletion predictor, giving producers an early warning to prevent fish kills.

Hanson focused on the automation of aquacultural acreage estimates. At present the Mississippi Agricultural Statistics Service can compute these figures annually. Geospatial technologies should help produce measurements in a more frequent and precise manner. The need for more refined calculations is driven by the Mississippi legislative mandate for actual use valuation for aquatic facilities when computing taxes.

“THE GOAL IS TO PROVIDE A NETWORKING ENVIRONMENT IN WHICH SCIENTISTS CAN SHARE THEIR STUDIES OF GEOSPATIAL TECHNOLOGIES APPLIED TO AGRICULTURE.”

CHUCK HILL

The next day, the event moved to Brooksville and began in the fields with a presentation by Mike Cox, MAFES researcher in Plant and Soil Sciences, on soil management zones. Cox discussed the differences found in similar management of three fields at the station.

Environmental scientist Joe Massey discussed remote sensing for soil management. Weed scientist Dan Reynolds updated attendees on site-specific weed management and site-specific cotton defoliation. He called variable-rate application techniques the “business end of precision agriculture,” but said the application problem is the resolution rate of the sprayers, which is not capable of adjusting to the new situation fast enough to keep pace with changing site-specific needs.

Agricultural engineer Jim Thomas discussed Soybean Management by Application of Research and Technology (SMART) systems with site-specific management. He displayed a survey-grade Global Positioning System (GPS) unit, accurate to within 1 centimeter, available from the RSTC for research applications.

After lunch, the tour moved indoors for sessions with agricultural engineer Alex Thomasson discussing site-specific management; plant scientist Raja Reddy with a presentation on remote sensing for cotton management; Mark Shankle, sweetpotato specialist at the Pontotoc Ridge-Flatwoods Branch Experiment Station, discussing site-specific sweetpotato management; and a presentation from John Cartwright, geospatial applications specialist with the Engineering Research Center, on site-specific data analysis and software.

Wes Burger, professor of wildlife and fisheries, discussed his work using remote sensing to improve wildlife habitat management. He specifically is looking at herbaceous field borders, a subsidized buffer program that serves as wildlife habitat. He is trying to determine if there is a crop yield loss or increased cost to maintaining this habitat for wildlife.

Roy Montgomery, College of Veterinary Medicine professor of basic science, is using Geographical Information System (GIS) to monitor and control poultry diseases. He said GPS maps can create buffer zones or hot zones for a potential disease outbreak and can aid in the control of that disease.

“This information can lead to plans and tools for disease control, which can help secure the industry’s export market,” Montgomery said.

The tour ended with presentations by agricultural engineers Filip To and Alex Thomasson. To demonstrated a high-speed soil sampler and in-pond inventory system, and Thomasson gave a demonstration of site-specific robotics.



Ned Brouning



Bonnie Coblenz



Bonnie Coblenz

Cotton FIELD DAY



Jim Lytle

By Linda Breazeale

Overcast skies did not deter more than 200 visitors to the Delta Research and Extension Center in Stoneville during the Aug. 14 Cotton Field Day, the first of two information-packed days at the research station.

Growers, industry representatives, Extension agents and other agricultural experts toured nine stops on the station's cotton fields. Presenters included MAFES researchers, Extension specialists, and representatives of U.S. Department of Agriculture's Agricultural Research Service.

Cotton Field Day presentations included:

- **Management of nitrogen and potassium in cotton/corn rotations.** The presenter was Wayne Ebelhar, MAFES agronomist.
- **Irrigation timing.** The presenter was Lyle Pringle, MAFES associate agricultural engineer.
- **Cotton disease and nematode control.** Gabe Sciumbato, MAFES plant pathologist presented research findings, including the new challenges coming from reniform nematodes.
- **Variety trials and developments in DREC lines.** John Creech, MAFES assistant agronomist and plant breeder, presented.
- **Developing cotton lines with natural pest resistance.** Jodi Scheffler, a research geneticist with USDA/ARS, presented the information.
- **Variety improvement using naked (fuzzless) cotton.** Rick Turley, USDA/ARS plant physiologist, provided the details.
- **Evaluation of row patterns: Solid, skip row and wide.** Steve Nichols, a postdoctoral associate with MAFES, explained that stands in 7.5-inch rows were not uniform like the 10- to 15-inch rows. Researchers also reviewed variety performance on various row patterns.
- **Evaluation of defoliant and various weed control programs.** Charles Snipes, MAFES plant physiologist, addressed the decision-making process and the challenges of controlling micronaire with defoliant use.
- **Management of cotton insects; Precision insecticide applications.** Aubrey Harris, MAFES entomologist, presented research findings on pests such as the tarnished plant bugs, cotton aphids, tobacco budworm and bollworms.



Jim Lytle



Jim Lytle



Jim Lytle

Kenneth Hood

Weather forum assesses impact of SCAN systems

By Linda Breazeale

At the conclusion of the Cotton Field Day, Mississippi farmers, agricultural scientists and consultants learned about the latest in weather technology during an afternoon forum on the new weather station network spreading across the country.

The Soil Climate Analysis Network, or SCAN, weather stations produce useful information for thousands of people from farmers to the Secretary of Agriculture. The U.S. Department of Agriculture-Natural Resources Conservation Service, National Water and Climate Center operates the comprehensive, nationwide soil-climate monitoring network.

Garry Schaefer, the leader of the Water and Climate Monitoring Branch in Portland, Ore., explained that SCAN sys-

Rice/Soybean FIELD DAY



Jim Lytle

By Linda Breazeale

Goosebumps at a Rice and Soybean Field Day in August? Not quite, but more than 200 visitors to the Delta Research and Extension Center in Stoneville were treated to one of the coolest Cotton Field Days in recent history as temperatures did not rise above 87 degrees on Aug. 15.

Growers, industry representatives, Extension agents and other agricultural experts toured nine stops on the station's rice and soybean fields.

Rice/Soybean Field Day presentations included:

- **Evaluation of rice breeding lines.** Dwight Kanter, MAFES agronomist, provided highlights from investigations of 100 lines at seven different locations.
- **Evaluation of various maturity groups in soybean/wheat double crop systems.** Presented by Lingxiao Zhang, MAFES assistant agronomist.
- **Soybean genetics research focused on alleviation of heat-induced yield loss; isolation of the long-juvenile gene and variety development.** USDA/ARS geneticists presenting information included Jeff Ray, Rusty Smith and Bob Paris.
- **Fertility and production practices in problem areas in rice.** Joe Street, Extension rice specialist, and Tim Walker, postdoctoral associate with MAFES, explained that the primary questions for 2002 have been concerning fertility issues. They encourage growers to address fertility before a crisis occurs. As higher-yielding varieties become more prevalent, more nutrients will be leaving the soil with the grain harvested.
- **Rice weed control.** Mark Kurtz, MAFES plant physiologist, explained current challenges and the most effective control methods.
- **Ultra-early soybean varieties and weed control strategies for early-planted soybeans.** Dan Poston, Extension soybean specialist/MAFES assistant weed scientist, and Matt Griffin, MSU graduate research assistant, addressed strategies for planting dates, evaluation of seeding rates and concerns for Roundup-Ready resistance.
- **Rice fertility with emphasis on breeding lines.** Wayne Ebelhar, MAFES agronomist, described 2002 as the weediest year ever. The Rice Promotion Board and Rice Producers of Mississippi funded his research on rice fertility.
- **MGII, MGIV and MGVI soybeans in irrigated and nonirrigated environments; causes of soybean seed decay.** USDA/ARS researchers Larry Heatherly and Alemu Mengistu provided an overview of their variety research.
- **Management of rice and soybean diseases and insects.** Gabe Sciumbato, MAFES plant pathologist, and Jim Robbins, MAFES assistant entomologist, explained recent challenges and control methods.
- **Soybean variety trials.** Bernard White, MAFES variety evaluations manager, gave an overview of variety research.

tems measure rainfall, air temperature, relative humidity, wind speed and direction, solar radiation, five depths of soil moisture and soil temperature, barometric pressure, and snow depth and water content. SCAN uses meteor burst technology to get access to information from a location "near real time." In August, there were 69 SCAN stations in 33 states.

Grower Kenneth Hood of Gunnison used a SCAN station on his farm in 2002. The information helps farmers make wise planting and risk management decisions.

"I can go to my computer and download information from the SCAN on my farm or any of the others around the state," Hood said. "The information provided is much more complex than on the Gossym/Comax (cotton crop simulation) systems."

Developers hope SCAN stations eventually will improve the ability to forecast weather, the most influential environmental variable in agriculture.

Bart Freeland was serving as a MAFES research associate at the time of the forum. He explained that MSU is responsible for seven of the state's 10 sites, which entails maintenance and repair of the systems and general upkeep. SCAN systems cost between \$12,000 and \$15,000 per site to set up and will last more than a decade.

"Our goal is to have one SCAN in each Mississippi county to be used to gather agricultural data for management decisions and future research," Freeland said.

MSU's Delta Research and Extension Center in Stoneville serves as one of four "master receiving stations" in the country, which resembles a data gathering hub for the national network.

Freeland, who now works for USDA's World Agricultural Outlook Board, encouraged farmers to visit DREC's website to access the SCAN data at <http://www.deltaweather.msstate.edu>.



WORST-CASE LOOK HELPS ANALYZE A STATE INDUSTRY

By Bonnie Coblentz

Two Mississippi State University researchers created a worst-case scenario to see what impact Mississippi's declining apparel industry could have on the state.

Darren Hudson and Stan Spurlock used an input-output economic model called IMPLAN to play the "what-if" game. They looked at what the complete loss of the apparel industry would do to the country.

"The study can be used to illustrate what's happening in these industries," said Hudson, an associate professor of agricultural economics with the Mississippi Agricultural and Forestry Experiment Station. "There's been considerable debate in the policy arena about what to do, and this study can give lawmakers in the United States and Mississippi an idea of how many people are being displaced as this industry weakens, economic output data, and more."

The study found that growth in textile exports has focused on semiprocessed yarns and fabrics, while apparel cutting, sewing and finishing have been in decline. U.S. imports of finished goods have grown dramatically.

This shift has important economic implications for Mississippi and several other Southern states. Hudson said the apparel sector of the industry employed 14,240 people in 1999 and had an industrial output of \$1.4 billion. However, employment in apparel in Mississippi dropped 31 percent from 1997 to 1999 alone.

The study assumed the state would continue to produce semiprocessed yarns and fabrics but lose the apparel-finishing industry to other countries. It estimates the state would experience a total industry output loss of \$2.3 billion and a total value-added loss of \$874.3 million.

"From the state's perspective, loss of the apparel industry would result in a total loss of tax revenue of \$57.4 million, which is about 3 percent of the state tax revenue," Hudson said.

Nationally, the industry would experience a total output loss of \$81.4 billion and a total value-added loss of \$144.7 billion.

Hudson said the apparel industry has been in decline for several years, but that decline has accelerated since the early 1980s. He attributed much of the decline to differentials in labor costs and environmental policies, and the phase-in of different trade agreements that opened worldwide access to U.S. markets.

"The apparel markets have been shifting out of the United States into other countries," Hudson said. "The North American Free Trade Agreement redirected the shift to Mexico, but it had been moving to Asia."

He said most people think the apparel industry is leaving the country because cheaper labor is available in less developed countries. Hudson said this is a factor, but not the most important one.

"While there are some labor cost advantages, the real differences are more lenient environmental and labor restrictions in these other countries and an exchange rate that favors foreign production and imports," Hudson said.

In the study, researchers did not consider other sectors of the textile industry or account for the potential job creation as the textile industry shifted to a greater use of technology. However, Hudson said the report still illustrates the importance of the apparel manufacturing sectors in the Mississippi and U.S. economies.

"These data clearly point out that the structural adjustments that are occurring within the textile industry are having an impact on the states that rely on these industries for employment and tax revenue," Hudson said.

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EDITOR'S NOTE:

Locate this article on the World Wide Web at:
<http://msucare.com/news/print/commnews/>

Workshop Educates on **INSECT REARING**

By John Hawkins

Specialists met in Starkville recently to study a subject that most people would find rather questionable: how to raise insects alive.

“Growing quality insects is crucial to many areas of entomology and integrated pest management,” said Frank Davis, Mississippi State University emeritus adjunct professor of entomology and workshop coordinator.

The five-day workshop, titled “Principles and Procedures of Rearing Quality Insects,” was sponsored by MSU’s Department of Entomology and Plant Pathology, in partnership with the U.S. Department of Agriculture’s Biological Control and Mass Rearing Research Unit.

Twenty-five specialists attended the event from such countries as Australia, Belgium, Germany, Switzerland, Canada and the United States.

This year’s workshops were dedicated to retired USDA researcher and former MSU adjunct professor, Alan Bartlett, who made many contributions to the area of insect rearing.

This is the sixth workshop MSU has offered for professionals who already work in insect rearing and research. Universities and colleges around the world offer courses in entomology, but none offer instruction in the science and technology of raising insects, Davis said.

“Insect rearing deserves and requires a formal education, but many specialists receive training from other specialists and experienced experts in the field,” Davis said.

“This course is the first of its kind anywhere in the world, and people come from many backgrounds, public and private, to take advantage of what we have to offer.”

Attendees had the opportunity to hear experts discuss topics such as insect diets, rearing systems and environments, diseases, genetics, quality control and management.

“Some of the workshop participants work in rearing parasites and predators, others grow insects such as butterflies that can be used by children and students as learning tools,” Davis said.

Those who participated in the course also toured the rearing facilities at the USDA laboratories and the Mississippi Agricultural and Forestry Experiment Station’s new state-of-the-art, insect-rearing lab at the Clay-Lyle



Frank Davis

Marco Nivovitch

Entomology Building.

“Participants also are given a manual that contains everything covered in the workshop,” Davis said.

“In the future, I hope the manuals provided in the workshops will be compiled into the first-ever insect-rearing textbook.”

In addition to informative talks and tours, the event provided attendees with a chance to meet colleagues and socialize.

EDITOR'S NOTE:

Locate this article on the World Wide Web at:

<http://msucares.com/news/print/agnews/>

MAFES facility provides relief for those with an itch for bugs

When it comes to bugs, most people swat them, a few collect them, and a dedicated handful of Mississippi State University researchers grow them.

MSU entomologists cultivate their “crops” in a sophisticated laboratory completed recently in the Clay Lyle Entomology Complex.

The Insect Rearing Center was built with funds provided by MAFES. Among its features are a laboratory boasting a hospital-type air filtration system and ample space for a variety of growing environments.

Frank Davis, an MSU emeritus adjunct professor and coordinator of

the center’s activities, said the university’s bug rearing efforts began in the 1960s as a joint effort by university scientists and U.S. Department of Agriculture entomologists involved in the study of cotton pest control.

“Originally, USDA focused on the boll weevil and the university grew bollworms and tobacco budworms in a facility dubbed the ‘worm shed,’” he explained.

Davis said the original boll weevil research resulted in two major achievements: a near elimination in the South of the boll weevil as an economic threat to cotton and the implementation of

environmentally friendly methods to control crop-destroying worms.

Crop pest control remains an important part of entomological efforts by MAFES scientists. The new insect-rearing facility also is allowing researchers to focus on the increasing demand by private companies and public laboratories for bugs grown for specific uses.

Ladybugs and other insects used to control garden pests and butterflies sought by creative event coordinators for release at weddings are among some of the commercial applications cited by Davis.



Bouncing babies arrive for heat-stress research

By Linda Breazeale

They look like normal calves frolicking at Mississippi State University's Dairy Research Unit, but researchers are hoping their genetics may hold the keys to understanding heat stress in dairy herds in the South.

While most dairy breeds in the United States are *Bos taurus*, which are more adapted for temperate climates, some efforts have been made by producers to crossbreed with Brahman, which are *Bos indicus* and more adapted to tropical climates. Those efforts at crossing were geared toward avoiding the summer slump in milk production and improving fertility rates during the hottest



Jim Lytle

months. Unfortunately, the sacrifice in milk production has not made Brahman crosses viable for the dairy industry in the United States.

"The practice of crossing Holsteins and some of the minor *Bos indicus* breeds has not been researched extensively with respect to the southern dairy industry," said Scott Willard, MAFES animal and dairy scientist. "While crossbreeding with common heat-tolerant *Bos indicus* breeds like the Brahman may not produce the intended results from the standpoint of milk production potential, other tropically adapted minor breeds of *Bos indicus*, which have higher levels of milk production, may impact farm profitability and specifically cow fertility during summer heat stress."

Willard is leading MSU's efforts in a multistate research project investigating the feasibility of another *Bos indicus* breed popular in Brazil: the Gir, sometimes spelled Gyr. When crossed with Holsteins in Brazil, they are referred to as Girolando cattle.

"We intend to investigate the effects of heat stress on reproductive performance in dairy cattle with these composite genetics (Gir x Holstein). We will look at milk production and quality, reproductive performance and heat tolerance in our production environments here in Mississippi," Willard said.

Girolando in Brazil produce 8,000 to 11,000 pounds of milk per lactation (about 300 days), but Willard said he hopes Holstein genetics, nutrition and management practices in the United States can improve on that rate. Holsteins in Mississippi produce about 21,000 pounds of milk per lactation.

"We also want to go beyond traditional investigative methods and look at what is happening at the molecular level. We



Willard, center, and research assistants make a hip measurement on a Gir calf.

Will Smith

Jim Lytle

should be able to see how genes are affected under heat stress,” Willard said. “Molecular mechanisms have not been evaluated in crossbred dairy cattle as extensively as they have in crossbred beef animals. The crossbred dairy cattle will be used for molecular studies evaluating the physiological and genetic basis for heat tolerance.”

As the crossbred offspring get older, Willard said MSU will collect embryos for *in vitro* studies and investigate the production performance characteristics of these cattle under different environmental conditions. Researchers will screen them for genetic markers that may code for heat tolerance beyond the obvious traits such as looser skin, longer ears and other *Bos indicus* traits that aid in their ability to get rid of excess heat.

MSU is teaming up with the University of Florida, the University of Georgia, the University of Wisconsin, the University of Tennessee, North Carolina State University, and the U.S. Department of Agriculture’s Agricultural Research Service, as well as other project collaborators in Brazil. The \$1.6 million research is supported by USDA’s Cooperative State Research, Education and Extension Service (CSREES) Grant through the Initiative for Future Agricultural and Food Sciences (IFAFS) program.

“Other universities are doing parallel studies regarding embryo research. All of this research will be a long-term commitment for the universities involved,” Willard said. “Milk performance data will not be available for three years from the first crossbred cattle, and it will be five years before the next generation yields milk data.”

At MSU, 34 mature Holstein cows have been bred with Gir semen and a similar number were bred with Holstein semen for comparative purposes. In the first couple of years, MSU researchers will be gathering vital statistics on every stage of development, from embryo to the calves’ growth characteristics to fertility rates in the next generation. Even bulls will be kept for several years of evaluation.

“Measurements on the calves will be taken from birth through puberty to get a handle on their growth characteristics compared to purebred Holstein calves,” Willard said. “We’re also interested in when the half-bloods will mature relative to Holstein heifers and bulls and will characterize various aspects of their reproductive physiology as they make this transition.”

Subsequent studies will incorporate breeding of Holstein cows during summer months with Gir semen versus Holstein semen to evaluate conception rates (tropical versus temperate genetics).

“We believe these investigations will lead to *in vitro* studies of crossbred embryo heat stress responses and the molecular mechanisms mediating these responses,” Willard said.

Ideally, Willard hopes to find higher summer conception rates than purebred Holsteins experience.

“Conception rates for Holsteins in cooler weather is 35 to 45 percent on first service, but during the hottest months, the success rate is closer to 20 percent,” Willard said. “We have real problems in the Southern region when heat stress occurs. While breeding to Gir may not be the answer, it may help us understand from the whole animal to the molecular level how our cows might deal with it better.”

Garden expo shows off fall opportunities



Bonnie Coblenz

By Bonnie Coblenz

The North Mississippi Research and Extension Center threw open its doors and gardens Sept. 28 to welcome visitors to the North Mississippi Garden Expo.

Crofton Sloan, event organizer, said threatening weather from Tropical Storm Isidore didn't keep about 450 people from coming, and rain held off for the day to be a success. Visitors could preview the entire event by participating in walking tours of the facility led by Lee County Master Gardeners.

From there, visitors could tour the gardens in more detail, take part in hands-on demonstrations in the Magnolia Botanical Gardens Pavilion, hear seminars indoors, or visit the information booths and plant sales set up under tents outdoors.

Early visitors got to see Extension horticulture specialist Lelia Kelly demonstrate how to craft with garden and native materials. Later in the morning, Tim Needham, Extension county director in Tippah County, demonstrated plant propagation techniques.

Seminars inside were from Margaret Gratz, the "Earth Lady," talking about discovering the natural world in backyards, and Eugene Randolph of the Memphis Bonsai Society discussing the art of bonsai.

Throughout the event, visitors stopped and smelled the roses as they browsed, admired, picked up tips and asked questions while they made their way through the various stops at the garden expo.

Special features were the vegetable and herb plots, pizza farm, ornamental greenhouse, rose gardens, butterfly tent, turf plots, annual and perennial beds, fruit trees, vegetable greenhouse, shade area and native plant garden.

Inside the main exhibit tent, several MAFES and Extension specialists answered questions on a variety of topics including composting, soil preparation, pesticide safety and plant diseases. They also helped gardeners identify unfamiliar plants and diagnose plant illnesses.

The North Mississippi Garden Expo is sponsored each fall by MAFES and the MSU Extension Service, with the help of several corporate sponsors and area volunteers.

24th Annual FALL FLOWER & GARDEN FEST

Crystal Springs / Oct. 18-19, 2002



Marco Niconich

Thousands of visitors to the Truck Crops Branch Experiment Station in Crystal Springs were treated to another outstanding year of spectacular displays and educational opportunities at the 24th annual Fall Flower & Garden Fest.

More than 2,000 people walked the grounds each day of the two-day event. Weather challenges from a tropical storm and a hurricane in the months before the event made organizers nervous, but by the time gates opened on Oct. 18, most of the flowers and vegetables were impressive.



Marco Niconich



Ornamental Hort Field Day & Herbaceous Open House

Almost 100 professional nursery suppliers and others from south Mississippi, Alabama and Louisiana attended the 30th annual Horticulture Field Day at the South Mississippi Branch Station.

The daylong activities included a tour of the station's research facilities and discussions of breeding studies, container research, and potting soil.



Photos by Marco Nicovich



Marco Nicovich

New USDA facility at Poplarville

U.S. Department of Agriculture/Agriculture Research Service personnel were on hand during the Horticulture Field Day to discuss the new USDA building planned for the South Mississippi Branch. The approximately 20,000-square-foot building will contain offices and research facilities for USDA-ARS, MAFES, and Mississippi State University Extension Service staff. Construction is expected to begin in fall 2003.



Marco Nicovich



NORTH MISSISSIPPI ROW CROPS FIELD DAY

By Bonnie Coblenz

Close to 200 people attended the North Mississippi Research and Extension Center's Row Crops Field Day Aug. 8. The event, sponsored by MAFES and the Mississippi State University Extension Service, was held at the Lee County Agri-Center and in the fields of the R&E center.

The event started with a discussion of Roundup-resistant weeds and ways to manage fields with these weeds. This discussion was led by Bob Hayes, a researcher at the University of Tennessee. Three Mississippi farmers followed this presentation with discussions of their own weed-control efforts.

The program then moved outdoors where MAFES and Extension researchers and specialists made presentations at three stops to view corn, soybeans and cotton growing in the NMREC fields. Joe Johnson, Ted Wallace and cotton grower Keith Morton discussed skip-row cotton and row spacing. Dan Reynolds discussed cotton's response to Roundup formulations.

"The best economic benefit to skip-row farming is harvest," said Morton, who farms 500 acres of skip-row cotton in Faulkner. "You stretch out the four-row picker to almost six rows, and you get the crop out faster."

Two disadvantages are that government programs only pay for 75 percent of skip-row acreage planted, and crop insurance is reduced as well.

Erick Larson and Don Parker told field day participants about corn borer management and narrow-row cotton. Parker said no-till farming is a contributing factor in the increase in these pest numbers.

Soybeans were the last stop on the tour. Normie Buehring and Alan Blaine talked about soybean's response to seeding rates in narrow rows and early soybean production for north Mississippi. Buehring emphasized the need to plant according to the recommended rate, and Blaine spoke on the importance of scouting for stinkbugs and worms.

Commissioner of Agriculture and Commerce Lester Spell wrapped up the half-day event with an overview of agriculture in the state. He addressed the new Farm Bill; boll weevil eradication; the Land, Water and Timber Resource Board; catfish and beef labeling; ethanol; and invasive cogongrass in his comments.

"Not only are we a good producer of agriculture, but we have a lot of diversity," Spell said of the state.

Photography by Marco Nicovich

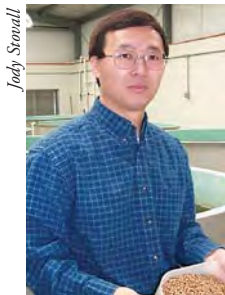


CATFISH FARMING

Less protein still makes good diet



Marco Nicovich



Jody Sonall

By Bonnie Coblenz

Researchers at Mississippi State University who are trying to formulate the best diet for catfish have found a protein mix that seems to be the most efficient.

Protein is added to catfish diets from either plant or animal sources. Catfish need protein for the same reasons every other living thing needs protein — bodies cannot make certain amino acids needed to function and must get these from food.

The animal protein added to catfish diets is usually fish meal, meat and bone/blood meal, or poultry meal. The primary plant source of protein is soybeans. Corn and wheat are mainly used for energy, but they also supply some protein.

Ed Robinson, MAFES researcher, and Meng Li, MAFES associate research professor, studied protein types and amounts in catfish diets. The studies were conducted at Mississippi State University's Delta Research and Extension Center in Stoneville.

To bring the highest profit to catfish producers, they found success in a diet of 28 percent protein with little or none of it animal protein.

"Producers typically feed a diet of 32 percent protein, but the research shows a diet of 28 percent protein is more than adequate," Robinson said. "A diet of 28 percent protein is the most economical for growth for fish from 6 inches long to harvest, which is about 2 pounds."

Robinson said feed is the single largest production cost for raising catfish, accounting for about 50 percent of the variable operating costs. Catfish feed is made primarily of soybean meal, with corn, wheat, fish meal and some-

times cottonseed meal. Vitamins, minerals and fat are added to the feed.

To test the diets, researchers stocked fingerling catfish into 60, one-tenth-acre ponds. They were placed in the ponds at either 6,000, 12,000 or 18,000 fish per acre, creating three stocking densities.

The fish were fed once a day on one of four diets for two growing seasons. The diets contained either 28 or 32 percent protein, with or without animal protein.

"Results show that there were no differences in any variable except for visceral fat and fillet fat between fish fed the 28 percent and the 32 percent protein diets," Robinson said.

Research results show producers can save \$8 to \$10 a ton by switching to a 28 percent protein diet from one that includes 32 percent. Robinson called this savings significant, saying that a farmer with 500 water acres could save as much as \$25,000 a year by reducing the costs of feed.

"That would pay someone's labor for the year," Robinson said. "If we can't save money on the feed, the research doesn't make any difference."

In addition to studying the amount of protein in diets, the research looked at whether the type of protein made a difference in catfish growth. Robinson said that while young catfish fry, or those less than 6 inches long, need animal protein, catfish being grown out for harvest perform equally well on plant and animal protein.

Plant protein is almost always cheaper than animal protein, but the reformulated diet keeps a bit of animal protein in as a safety margin.

Jim Lytle



Ed Robinson

"We were trying to reduce the amount of animal protein needed in catfish diets," Robinson said. "Even though animal protein may be a little higher quality than plant protein, you can balance the plant protein and still get the same benefit in the catfish."

EDITOR'S NOTE:

Locate this article on the World Wide Web at:
<http://msucare.com/news/print/fwnews/>

“WE MIGHT NOT BE
ABLE TO SOLVE THE
MOSQUITO NUISANCE
PROBLEM IN AN AREA,
BUT IT COULD REDUCE
THE DISEASE THREATS
THEY PRESENT.”

MIKE CAPRIO

By Bonnie Coblenz

Scientists at Mississippi State University engaged in the battle against mosquitos and mosquito-borne diseases have found clues in the wingbeats of different species.

Primarily, there are three species of the *Anopheles quadrimaculatus* mosquitos found in Mississippi. One is found in the rice lands of the Delta, while two others typically inhabit the woodlands.

Mike Caprio, associate professor of insect genetics with the Mississippi Agricultural and Forestry Experiment Station, said the three species look identical. Previously, the only way to identify the species was to analyze the proteins or use radioactive DNA probes.

“We found we were able to tell them apart in terms of wingbeats for males,” Caprio said. “The next question we wanted to answer is whether it is a genetic trait, and we found that it is.”

Caprio shined a light beam through a vial containing a mosquito and recorded with a sensor the wingbeat frequency.

“We could record the changing pattern in the light beam

Mosquito wings may yield clues for control

to identify the species,” Caprio said. “In theory, researchers in the field could run a narrow light beam and detect anything flying through that light beam to identify the species.”

He found that males of these species have different, identifiable patterns in the fluttering of their wings. The females do not have similar wingbeats. The research also found that each male’s wingbeat pattern was something it inherited, and so was genetically determined.

The project ended before researchers were able to determine whether females use this wingbeat pattern in mate identification and locating appropriate swarms of males.

“We were trying to decide if we could somehow create some mating confusion in females,” Caprio said.

Males of these mosquito species form mating swarms. One of the questions left unanswered was whether researchers could develop males with offbeat wingbeat patterns, or project the correct wingbeat sound to confuse females. A species that is unable to mate effectively will find its numbers greatly reduced.

Potential of this research could lead to the replacement of a mosquito species that is an effective disease carrier with one that is less effective at transmitting a disease.

“We might not be able to solve the mosquito nuisance problem in an area, but it could reduce the disease threats they present,” Caprio said.



EDITOR'S NOTE:

Locate this article on the World Wide Web at:
<http://msucares.com/news/print/fwnews/>

Dairy scientist receives national recognition



Fuquay

Retired MAFES dairy scientist John W. Fuquay recently received recognition for his work from the American Dairy Science Association.

The 2002 international meeting in Canada was the second annual meeting in a row in which Fuquay received special recognition from the ADSA. Fuquay earned the award of honor, which is given annually and recognizes a person who has contributed in an unusually outstanding manner to the welfare of the association.

A member of the ADSA for more than 35 years, Fuquay has devoted more than 15 years to the Journal of Dairy Science. As a member of the editorial board and as editor-in-chief of the journal he has incorporated several changes that have helped it to become the most highly recognized publication in its subject area.

Fuquay has been active at ADSA annual meetings and in 2001 the ADSA named Fuquay a fellow for distinguished service to the industry. His research efforts have focused on heat stress in dairy cows and how this affects reproductive performance and milk yield.

Fuquay's research has demonstrated the importance of having cooling systems available for cows prepartum and postpartum to minimize heat stress and maximize reproductive performance and milk yield.

In 1980, he wrote *Applied Animal Reproduction* in cooperation with Joe Bearden. Now in its fifth edition, this text has been widely adopted for undergraduate instruction in the United States and has been translated into Spanish.

Fuquay received his bachelor's and master's of science degrees from North Carolina State University and his doctorate from Pennsylvania State University. He came to MSU in 1969 and retired in 1999.

MAFES friend retires after 35-year career



By Bonnie Coblenz

A man who spent much of his career studying runoff and erosion at the North Mississippi Branch Experiment Station has retired after 35 years of federal work.

Keith McGregor retired Oct. 2 from the U.S. Department of Agriculture-Agricultural Research Service's National Sedimentation Laboratory in Oxford. He was an agricultural engineer in USDA's Upland Erosion Processes Research Unit.

Most of his research was conducted at the MAFES branch station near Holly Springs working with Joe Johnson. Johnson was responsible for crop management, while McGregor handled the engineering side of the research.

McGregor "Keith is a top-notch scientist who does real good work," Johnson said. "I'm grateful for the contribution he has made to the science of erosion and the contribution he's made through the years to the North Mississippi Branch Station."

Among his research projects, McGregor studied the effects of planting on a contour, crop rotation's effect on erosion, soil erosion on fallow land without a vegetative cover, terracing, conservation tillage and rainfall erosion. Much of his work focused on the sediment characteristics of soil.

Johnson said McGregor is noted for his work with the universal soil loss equation and the revised version of this equation, which is used to determine the erodibility of a field.

After 30 years, he co-wrote a MAFES bulletin with Johnson and two other scientists. The bulletin, "Cooperative Soil Conservation Studies at Holly Springs 1956-1996," featured the interaction between MAFES and USDA-ARS. This work has had far-reaching impacts on conservation planning throughout the nation.

McGregor earned a bachelor's degree in agricultural engineering from Mississippi State University, a master's in biological and agricultural engineering from North Carolina State University, and a Ph.D. in engineering science from Louisiana State University.

Before working with the USDA National Sedimentation Laboratory, he worked for the Tennessee Valley Authority.

His bulletin can be found online at <http://msucares.com/pubs/bulletins/b1044.htm>.

in brief



Marco Niconich

Recipients and presenters of the 2002 Wise Support Staff Awards include (l-r) Lisa Chrestman, Elizabeth Cook, Blake Garrard, Mitchell Roberts, Doris Wise, and Vance Watson, interim vice president for agriculture.

Staff Members Receive Wise Award

Four staff members from the Division of Agriculture, Forestry and Veterinary Medicine received the 2002 Louis and Doris Wise Support Staff Awards.

Lisa Chrestman, animal health technician at the College of Veterinary Medicine; Elizabeth L. Cook, secretary to the head of the Delta Research and Extension Center; Blake Garrard, farm supervisor at the Dairy Research Center; and Mitchell Roberts, superintendent of the Research Support North Farm, were honored with the 2002 awards.

In 1986, the Wises established the award from a retirement gift and turned it into an endowment to benefit the division's support staff. Each honoree receives \$400 and a plaque.



Marco Niconich

Advancing Agriculture

Four recipients of the William M. White Special Project Awards in 2002 are (from left) Tim Chamblee of the Poultry Science Department, Peter Ryan of the Animal and Dairy Science Department, Filip To of Agricultural and Biological Engineering, and Scott Willard of Animal and Dairy Science. Joining the winners are Frances White, widow of William White, and Vance Watson, vice president for MSU's division of agriculture, forestry and veterinary medicine. The program provides financial support for worthy projects that further the development of agriculture and agribusiness in Mississippi.



Ned Browning

MAFES/MSU Extension Annual Conference

Aquaculturist Lou D'Abramo, left, received the 2002 Outstanding MAFES Worker Award during the MAFES/MSU Extension Service Annual Conference. Mississippi Chemical Corp. Vice President Joe Ewing presented the award.



Jim Lyle

Soybean Variety Tests

Wayne Dulaney, left, and Bernie White, MAFES Variety Testing manager, were among the participants in the 2002 Soybean Variety Trial Field Day. The event was held at Dulaney Seed Co. fields near Clarksdale. Dulaney Seed Co. is a cooperator in Mississippi State's soybean variety trials.

Marshall Honored For Food Protection Work



Marshall

MAFES food microbiologist Douglas Marshall is the recipient of the International Association for Food Protection 2002 Educator Award.

Each year, the award is presented to an individual for outstanding service to the public, the IAFP and the field of education in food safety and food protection.

An expert in food microbiology and public health, Marshall has conducted research at Mississippi State on ways to improve the quality and safety of foods, including developing rapid methods of quality and safety evaluations. He

also teaches course in food-borne diseases, food safety, quality assurance and control, and product development, among others.

His research has been featured in such scientific publications as the journals of Food Quality, Food Safety and Food Science, as well as Food Microbiology.

Marshall holds bachelors and masters degrees from the University of Nebraska and a doctorate from the University of Florida.

The IAFP, founded in 1911 and based in Des Moines, Iowa, is a nonprofit association of food safety professionals dedicated to education and service. Its membership includes more than 3,000 individuals from 50 nations.

Calendar of Upcoming Events

- March 7, 2003** Central Mississippi Research and Extension Advisory Council Meeting, Raymond
- March 8-9, 2003** Garden and Patio Show, Mississippi State Fair Grounds, Jackson
- March 11-13, 2003** Greenhouse Tomato Short Course, Mississippi Agricultural and Forestry Museum, Jackson
- June 3-5, 2003** Mid-South Greenhouse Growers Conference, Eagle Ridge Conference Center, Raymond



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Mississippi Agricultural and
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Box 9625
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