MAFES RESEARCH

HIGHlights

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Mississippi Agricultural and Forestry Experiment Station

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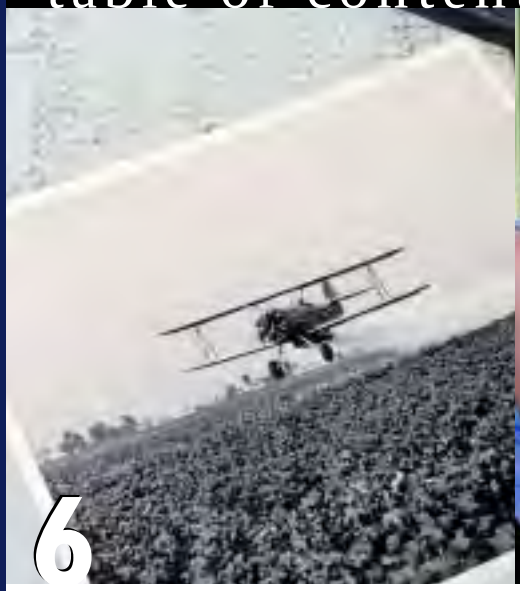

from the
DIRECTOR

Mississippi, like every state, has specific geographic boundaries that define its location. Contained within those boundaries are its natural resources: rivers and streams; hills and valleys; forests and beaches. None of these, however, is as important in defining what Mississippi is as its people.

The majority of MAFES research is focused on the state's natural resources, but its goal is to benefit Mississippians—all 2.8 million of us.

This issue of MAFES Highlights has reports on some of the projects that have a direct impact on people.

Dr. Linda Southward and other MAFES personnel at Mississippi State University's Social Science Research Center are teaming with health care professionals to find ways to better reach some of our youngest citizens with basic health services.

At the South Mississippi Branch, Dr. Patricia Knight is leading research in support of the individuals who work in the state's multimillion dollar commercial nursery industry, as well as the homeowners who benefit from the availability of landscaping plants and fruit trees adapted to their region.

Hunting and fishing are important recreational activities in Mississippi, and research is under way that will benefit those who participate in these sports and the landowners who depend on them for a portion of their income. One such MAFES-supported project is evaluating practices Delta rice farmers can use to attract more ducks and other overwintering waterfowl to their fields.

MAFES scientists on the Starkville campus and at every branch station are continually involved in projects that support the farmers who produce the food and fiber we all depend on. The latest recipient of the MAFES Researcher of the Year Award, Dr. Lou D'Abramo, is one of those individuals and you can learn more about him on page 23.

This issue also contains a report on a project that's preserving the record of our rural heritage. The Consortium for the History of Agricultural and Rural Mississippi, or CHARM, is a cooperative effort of the Mississippi State University Libraries, the Division of Agriculture, Forestry, and Veterinary Medicine, and others to collect, catalog, and make available for research materials related to the state's rural history.

Whether it's applying the latest technology to today's needs or helping preserve a record of where we've been, MAFES personnel are working to make life better for all of us.

Vance H. Watson
Director

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MAFES RESEARCH HIGHlights

MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION

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MAFES horticulturists Cecil Pounders, left, Christine Coker, and Patricia Knight.

Horticulture research helps homeowners find the landscape plants they want

By Bob Ratliff

Anyone who has driven U.S. Highway 90 from Gulfport to Pascagoula knows the Mississippi Gulf Coast has changed. Fluorescence-draped casinos and high-rise hotels line a beach that was just a few years ago dominated by fishing boats.

Another change taking place along the Coast and other areas of Mississippi is the trend toward homes with smaller, but well landscaped lots, according to MAFES horticulturist Patricia Knight at the South Mississippi Branch Experiment Station in Poplarville.

"With the trend toward smaller lots, there is increased demand for dwarf varieties and other types of plants that work well in smaller spaces," she said. "Among the projects we have under way is work with irradiated seed and genetic selection to produce dwarf magnolias."

MAFES scientists conduct research with ornamental plants and production methods at several locations, but research with landscape plant varieties currently in demand and those that have promise for the future is a primary focus at the South Mississippi Branch. In addition to Knight, horticulturists conducting research at the branch station include Christine Coker and Cecil Pounders.

"At the station, we evaluate plant material ranging from herbaceous annuals and perennials to shrubs and trees," Knight said.

Knight, who is in charge of ornamental horticulture research at the station, explains that there is a lot more to the work than just growing pretty flowers or green shrubs.

"Ornamental horticulture research at the station involves a comprehensive approach," she said. "Research projects are currently under way in the areas of weed control, fertilization, plant selection, and media components."

THERE IS A LOT MORE TO THE WORK THAN JUST GROWING PRETTY FLOWERS OR GREEN SHRUBS.

South Mississippi nurseries play an important role in the station's research by providing input about the needs of the industry and by providing a commercial setting for some of the research.

"All of our research is aimed toward helping Mississippi's horticulture industry," Knight explained. "The industry is very supportive in providing time, plant material, space, and anything else needed to make our research with ornamental plants a success."

The MAFES research helps make the state's horticulture industry more productive, according to Dan Batson, president of Green Forest Nursery in Perkinston.

"The researchers are interested in everything from propagation to shipping," he said. "Their work has the potential to help our industry take great strides toward production efficiencies through mechanization."

One indication of the success of the ornamental horticulture work at the station is its selection for participation in the National Arboretum's plant evaluation and release program. Horticulturists at the station have evaluated cold-hardy, disease-resistant crape myrtles for the program since 1985.

Such evaluations are important in helping nurseries provide their customers with plants that will perform well.

"Just because a plant is popular with homeowners doesn't mean it will do well in the heat of south Mississippi," Knight said.

The research scientists also try to stay at least a step ahead of trends in the landscape industry and consumer demand.

"We want to anticipate the needs in the future," Knight said. "We want to give them the things they will need 10 years in the future."

Bob Ratliff

Bob Ratliff

Bon appetit for blossoms?

It started with the ancient Romans, was extremely popular in Victorian England and is again in vogue. The practice is the use of edible flowers in cooking.

Today, many restaurant chefs and innovative home cooks garnish their entrees with edible flowers for a touch of elegance.

"Since many fine restaurants now offer flowers as a decoration or food, there is a potential high-return niche market for suppliers of those flowers," MAFES horticulturist Patricia Knight said. "As a result, the Mississippi nursery industry needs more information about flowers with potential for this market."

Knight and fellow horticulturists Christine Coker at the Coastal Research and Extension Center in Biloxi and Glenn Fain at the Truck Crops Branch in Crystal Springs are conducting research with one of the most popular edible flowers—the daylily. The project is supported by the USDA Agricultural Research Service through a MAFES internally competitive Alternative Crops and Value Added Products grant.

Sales of daylilies by Mississippi nurseries total about $100,000 each year, and Knight said that figure could be increased by sales for use in cooking.

"Since Mississippi has its share of fine restaurants and is in proximity to other Southeast markets, the edible flower market deserves consideration," she said. "This could be a supplement to the state's already strong ornamental horticulture industry."

The university horticulturists are conducting the initial phase of the research, which is to determine if flower color influences taste.

"We are growing daylilies at Poplarville for use in taste tests," Knight said. "Participants will be volunteers from garden groups who will be asked if they can tell a difference in the taste of test samples."

The tests will be conducted at the new James E. Garrison Sensory Evaluation Laboratory on the MSU campus.

Similar research with lotus is planned and Fain is currently growing lotus for the project at Crystal Springs. Market evaluations will be conducted later in the project.

Keith Remy

Daylilies - Slightly sweet with a mild vegetable flavor, like sweet lettuce or melon. Their flavor is a combination of asparagus and zucchini. Some people think that different colored blossoms have different flavors. To use the surprisingly sweet petals in desserts, cut them away from the bitter white base of the flower. Also great to stuff like squash blossoms. Flowers look beautiful on composed salad platters or crowning a frosted cake. Sprinkle the large petals in a spring salad. In the spring, gather shoots 2 or 3 inches tall and use as a substitute for asparagus.

Following are some simple guidelines to keep in mind before you eat any type of flower:

- Eat flowers only when you are positive they are edible. If uncertain, consult a good reference book on edible flowers prior to consumption.
- Just because flowers are served with food does not mean they are edible. It's easy and very attractive to use flowers for garnish on plates or for decoration, but avoid using nonedible flowers this way. Many people believe that anything on the plate can be eaten. They may not know if the flower is edible or not and may be afraid to ask.
- If pesticides are necessary, use only those products labeled for use on edible crops.
- Do not eat flowers from florists, nurseries or garden centers. In many cases these flowers have been treated with pesticides not labeled for food crops.
- Do not eat flowers picked from the side of the road. Once again, possible herbicide use eliminates these flowers as a possibility for use. Remove pistils and stamens from flowers before eating. Eat only the flower petals for most flowers.
- Introduce flowers into your diet in small quantities one species at a time. Too much of a good thing may cause problems for your digestive system.
- If you have allergies, introduce edible flowers gradually, as they may aggravate some allergies.

Reproduced with permission from the What's Cooking America website—http://whatscookingamerica.net.

MSU Collection Preserves Mississippi's Rural Past

By Bob Ratliff

Mississippi's history is closely tied to the land — from the era when flatboats moved the cotton harvest to the Gulf of Mexico to the current technology revolution in agriculture.

Preserving the stories of the people and events that have shaped the state's rural life is the goal of a new program at Mississippi State University.

The Consortium for the History of Agricultural and Rural Mississippi, formed in 2002, is ensuring preservation and access to important documents related to the individuals and organizations that built the state's rural heritage.

CHARM partners include the MSU Libraries, the Mississippi Agricultural and Forestry Experiment Station, the MSU Extension Service, the College of Veterinary Medicine, the College of Forest Resources, and the College of Agriculture and Life Sciences. The CHARM collection is housed in MSU's Mitchell Memorial Library.

"Agriculture and forestry have played significant roles in the development and history of this state," said Vance H. Watson, vice president for agriculture, forestry and veterinary medicine. "Exploring the past through documents like early plantation journals and vintage photographs can help students and others understand and appreciate the rural, agricultural roots of Mississippi and the role they played in defining our state and its people."

> "Agriculture and forestry have played significant roles in the development and history of this state."
>
> Vance H. Watson

In just a few months, the project has already brought together an impressive array of documents and artifacts.

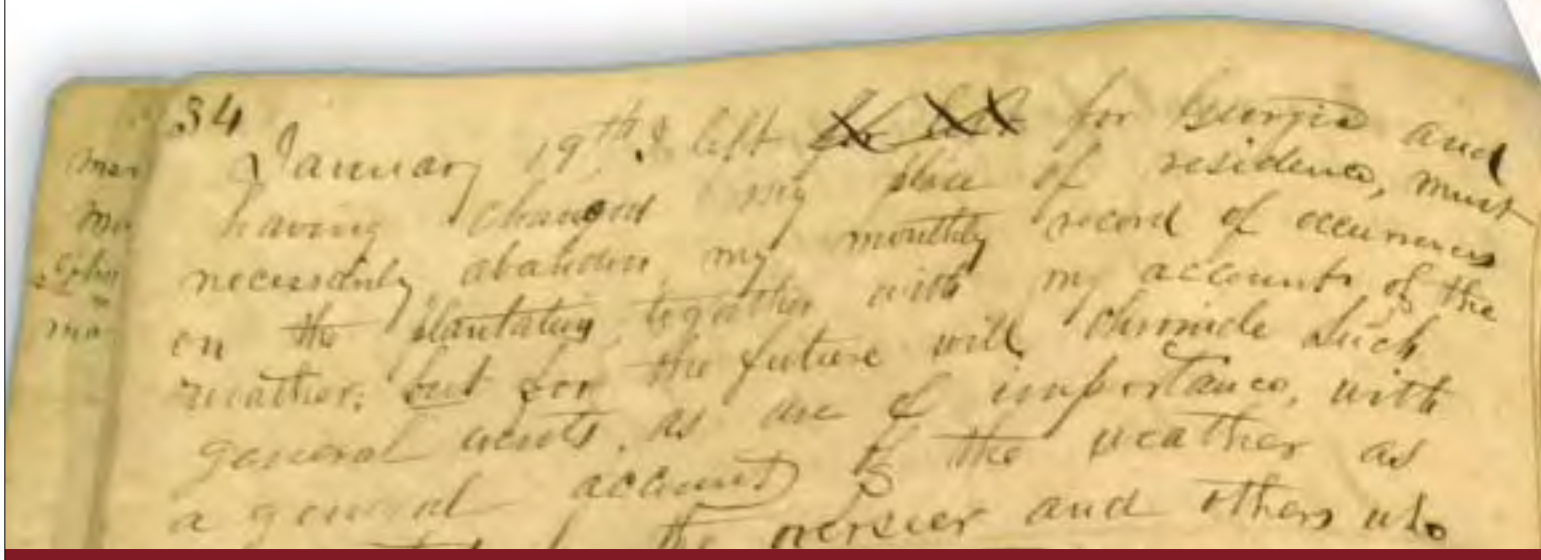
"Our manuscript materials document everything from small farms and family-run sawmill operations to corporate agricultural and forestry enterprises," said Mattie L. Sink, manuscripts librarian for Special Collections. "The collection also includes more than 300 handwritten scripts from the television feature, 'Farm Family of the Week,' which was broadcast by WLBT-TV in Jackson from 1954 to 1961."

Photographs, diaries, account ledgers and a host of other materials provide glimpses into day-to-day rural life, including concerns about the weather, the economy and the changing face of agriculture.

Another important part of the collection is materials from the university archives, including photographs, reports and other MSU Extension materials. Oral histories from individuals who have played leadership roles in Mississippi agriculture also are being collected.

"The project establishes a single location to preserve the materials," said Frances N. Coleman, dean of libraries. "It makes them accessible in a setting where large collections of other, more general information about Mississippi and its past are already available for reference."

Technology is rapidly changing both the business of agriculture and rural life, Watson said, making the CHARM proj-



ect especially important in preserving an accurate record of the past for future generations.

"We're not far removed from a time when animals provided the primary power for agriculture," he said. "Today, we're making use of advanced technologies such as satellite-based remote sensing to pinpoint the nutrient and other needs of a crop."

To expand its accessibility, the consortium is digitizing materials in the collection and making them available on the World Wide Web at http://library.msstate.edu/charm.

The CHARM project also can help families and individuals preserve materials that have historical significance.

If the materials are suitable, the MSU Libraries will gladly add them to the CHARM collection, preserving and cataloging them for access by scholars and the general public," Coleman said.

For additional information on CHARM, contact Coleman at (662) 325-7761.

Jim Lytle

MANUSCRIPTS LIBRARIANS MATTIE SINK, LEFT, AND SARA MORRIS CLEAN, CATALOG AND FILE CHARM MATERIALS.

Jim Lytle

University personnel consider animal safety

By Laura Whelan

While some people are preparing for a biological crisis with duct tape and plastic, Mississippi State University representatives are considering the animals in the food supply and the veterinarians who examine them.

John Huston, the MAFES Prairie Research Unit facilities coordinator, knows he cannot predict a crisis impacting animals, but he wants to be prepared. He serves as an animal technician on the Veterinary Medical Assistance Team, a federally funded program providing disaster relief to animal victims.

In December, he attended an intensive VMAT training session in North Carolina. Participants were trained in animal handling, foreign animal diseases, bioterrorism and food safety, and they went through a mock disaster situation of a hurricane hitting North and South Carolina.

"The training was intense because right now we have a heightened awareness of the potential threats that exist, especially terrorism," Huston said.

Since 1998, VMAT has provided veterinary assistance in disasters such as Hurricane Floyd in North Carolina, the foot-and-mouth outbreak in the United Kingdom and the World Trade Center attack.

> "We need to have plans in place so that if a disaster strikes, it has a minimal impact on our animals."
>
> JOHN HUSTON

When a crisis occurs, VMAT issues a call to its members. The veterinarians and technicians respond on a voluntary basis because of the typical 30-day commitment required. Members work cooperatively with local veterinarians and emergency responders to triage and stabilize patients.

"It is critical to work with the organizations that already exist in a disaster area," Huston said. "From the events of Sept. 11, 2001, we learned how important it is for groups like the police, fire department and emergency medical teams to work together in a crisis. We would apply this same tactic to a disaster involving animals."

Huston said the purpose of the training and instruction was to reinforce procedures and protocol so that if a disaster occurs, the response is second-nature.

"You want to get to a point where your response is so prepared, you don't even have to think about it. You just react quickly and efficiently," he said.

Huston is also trained to deal with the possibility of bioterrorism, which he defined as "any intentional act using a biological agent as a weapon." He said the main concern is that bioterrorists could use airborne weapons to contaminate the food supply, possibly by targeting large feedlots that contain 50,000 to100,000 animals.

"These areas are vulnerable to attack, and we have to be aware of the risks. An attack on our food supply could be devastating," he said. "After all, the strength of a nation is its ability to feed its people."

The Prairie Research Unit has its own biosecurity plan in place in case of a disease outbreak or emergency. The Unit monitors visitors closely and has no fence-line contact with other animals. Workers use rubber boots and disinfectant to minimize disease transmission.

Huston said that although the public needs to know the dangers and be ready for the possibility of a threat, they should not live in fear or panic.

"A lot of people are paying attention to the risks right now. We have to be aware, but we can't allow it to inhibit our lives or our happiness," he said. "Preparation allows us to become organized and educated. We need to have plans in place so that if a disaster strikes, it has a minimal impact on our animals."

MSU's College of Veterinary Medicine is also making an effort to educate veterinary practitioners about preventing and preparing for disaster situations or disease outbreaks.

Dr. Carla Huston, John's wife and assistant professor of epidemiology in the College of Veterinary Medicine, recently lectured on biosecurity procedures at the Foreign Animal Disease Short Course at MSU. Forty-one practitioners, 15 MSU faculty members and 15 veterinary students attended a series of seminars concerning bioterrorism, foreign animal disease transmission and biosecurity.

"Biosecurity refers to measures taken to prevent the introduction or reintroduction of diseases into susceptible populations. Biosecurity measures would help us prepare for acts of bioterrorism, and might even prevent disastrous consequences," she said. "For farmers and agricultural workers, these steps include quarantine of new or sick animals, knowing the sources of new additions, cleaning and disinfecting, and restricting visitors and vehicles."

Carla Huston also reported that vets have a heightened awareness of bioterrorism and biosecurity measures. She is a member of MSU's College of Veterinary Medicine Disaster Committee, which meets several times a year to discuss disaster preparation on a college level and functions as a liaison to the Board of Animal Health.

"Vets are at a level of heightened awareness concerning the threat of disease or disaster," she said. "They are becoming more aware of their surroundings and clients, and they are reporting anything unusual they may find in their animals."

Marco Nicovich

Marco Nicovich

John Huston

New institute designed to strengthen MSU high-tech resources

Jim Lytle

State-of-the-art scientific visualization equipment is used in the work of the GeoResources Institute.

By Bob Ratliff

Four technical centers at Mississippi State are pooling their resources and personnel to better meet common educational and research goals.

The university's newly designated GeoResources Institute combines missions and expertise areas of the Remote Sensing Technologies Center, Mississippi Water Resources Research Institute, Computational Geospatial Technologies Center, and Visualization, Analysis, and Imaging Laboratory.

"By administratively reorganizing into the GeoResources Institute, we will have more resources to address some pressing issues, including water quantity and quality, efficiency of agricultural production, and invasive species monitoring and management," said director David Shaw.

"The collaboration will maintain and continue to enhance our close relationships with other university departments and external agencies, as well as allowing us to take advantage of the tremendous current and future funding opportunities," he added.

Established three years ago, the Remote Sensing Technologies Center has gained widespread recognition for its partnership efforts with a variety of private industries and public sector agencies. The alliances have involved a number of high-profile remote sensing and geospatial projects related to agriculture, forestry, environment issues, state and local government, and transportation.

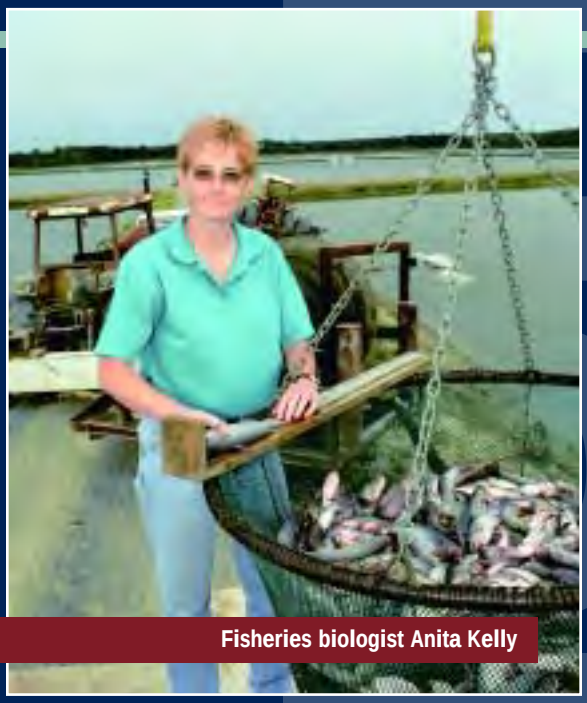
> "BY ADMINISTRATIVELY REORGANIZING INTO THE GEORESOURCES INSTITUTE, WE WILL HAVE MORE RESOURCES TO ADDRESS SOME PRESSING ISSUES, INCLUDING WATER QUANTITY AND QUALITY, AGRICULTURAL COMPETITIVENESS IN A WORLD MARKET, AND INVASIVE SPECIES MONITORING AND MANAGEMENT."
>
> DAVID SHAW

The federally mandated Water Resources Research Institute is part of a national network administered through the United States Geological Survey. Each state institute is charged with recruiting and training water scientists, exploring new approaches to water problems and providing water-related research results to water managers and the public.

The Computational Geospatial Technologies Center, a part of the university's Engineering Research Center, works with government, commercial and public interests to research, develop and validate computational geospatial information products. It also helps apply those products to terrestrial, hydrologic, oceanic and atmospheric processes.

Also at the ERC, the Visualization, Analysis, and Imaging Laboratory's work includes the use of high-performance computing to apply state-of-the-art scientific visualization to real-world problems, such as 3-D forest canopy structure and ocean flow changes.

"Bringing these four centers together at MSU allows us to further develop our common goals, as well as pool our talents and resources on research and educational projects," Shaw said. "It also allows us to enhance already strong relationships with various academic and research departments and colleges throughout the university and to pull teams of faculty together for multidisciplinary projects that develop solutions to meet the needs of society and our stakeholders."



Fisheries biologist Anita Kelly

Jim Lytle

Scientists tackle "off-flavor" catfish

By Bob Ratliff

Three scientists in a variety of disciplines are teamed at Mississippi State University to find a solution to one of the catfish industry's costliest problems.

Anita Kelly, a fisheries biologist in wildlife and fisheries, William Holmes, a research scientist with the Mississippi State Chemical Laboratory, and Tor Schultz, a wood chemist in forest products, are investigating new ways to prevent occurrences of "off-flavor" in farm-raised catfish. Their findings to date suggest some common products may offer immediate help in controlling a problem that costs catfish producers nearly $60 million annually.

"Compounds produced by blue-green alga in ponds can cause channel catfish to develop an undesirable musty or muddy taste known in the industry as off-flavor," said Kelly. "Producers must hold fish with this condition off the market until the flavor quality improves."

Because of lost sales and the high cost of current control methods, the condition has been identified by catfish farmers as one of the most serious problems facing the predominately Southern industry.

MAFES, the Forest and Wildlife Research Center and the Mississippi State Chemical Laboratory fund the project.

Because compounds similar to those produced by pine trees were determined to be the root of the problem, Schultz was a logical partner for the research effort.

"The blue-green alga produces two chemicals that accumulate in catfish tissue and result in a musty or muddy flavor," Schultz said. "The alga can be controlled with copper sulfate, but there is an environmental concern about the use of copper in lakes and ponds."

Producers also can eliminate off-flavor by transferring affected fish to ponds with clean water, but Schultz said that solution takes significant time and labor. Additionally, stress resulting from the move usually kills precious numbers of the fish.

Kelly and Schultz said their study involves the use of hydrophobic compounds that have the ability to absorb various chemicals but are insoluble in water. The compounds, including paraffin wax, common plastics, rubber, and corn oil, have the additional cost and environmental benefits.

"We found that 85 percent of the chemicals that cause off-flavor can be absorbed in 24 hours by adding a small amount of an organic substance to pond water," Schultz said. "The process is both environmentally friendly and cost - effective."

As the university applies to patent the process, the scientists are continuing their work.

"Several hydrophobic compounds have proven effective in tests, and we presently are concentrating on the right formulation," Kelly said. "We want the final product to be in a solid form, such as wax, that can be easily handled by catfish producers and also be easily removed from ponds once the off-flavor compound has been absorbed."

Jay Ferchaud

Drs. Stephen Silberman and Neva Penton-Eklund are conducting examinations as part of the children's health care initiative.

Research focuses on brighter smiles for kids

Children at childcare centers in Tunica, Greenville and other Delta locations are helping researchers learn more about one of the nation's biggest childhood-health problems—decay in primary, or baby, teeth known as early childhood caries.

By Bob Ratliff

Students at 16 Delta childcare and Early Headstart Centers, along with their parents and teachers, are participating in a two-year oral health care initiative funded by a grant from the federal Agency for Healthcare Research and Quality.

"Children in the rural South face some specific health challenges, including those related to oral health care," said MAFES social scientist and Social Science Research Center Family and Children Research Unit coordinator Linda H. Southward. "A recent report by the U.S. Surgeon General cited oral disease, especially early childhood caries, as one of the nation's greatest preventable childhood-health problems."

In the children's oral health care initiative, Southward and Mississippi State University research psychologist Elisabeth Wells-Parker are leading a group of health researchers that includes scientists from the Center for Child Health Research of the American Academy of Pediatrics, the Departments of Diagnostic Sciences and Pediatric Dentistry at the University of Mississippi Medical Center's School of Dentistry, Columbia University School of Dentistry and Oral Surgery, and the Children's Dental Health Project in Washington, D.C.

"The grant makes possible a research network of childcare centers to conduct oral health assessments of preschool children in the Delta," Southward said. "Some of the country's leading pediatric dentists are consultants for the project."

"What we learn here can have far-reaching implications for the state and the nation."

LINDA SOUTHWARD

The social scientists and dental professionals have developed a questionnaire for parents and daycare workers to determine behaviors and practices that play a role in early childhood caries.

"A lot of research is available for adults and older children, but there is very little information for preschool children," said Dr. Stephen Silberman, professor and chairman of the Department of Diagnostic Services at the University Medical Center's School of Dentistry in Jackson.

Silberman and Dr. Neva Penton-Eklund are conducting examinations of children at the participating Delta daycare centers. Penton-Eklund is an assistant professor of pediatric dentistry at the UM School of Dentistry.

The health-history questionnaire for parents and daycare workers, however, is the first step in making a caries risk assessment, Silberman added.

"We want to find out the parent's oral health history," he said. "We're also asking the parents and childcare center personnel about what the children eat and drink."

Information on eating and drinking habits is important because prolonged and frequent exposure to sugary liquids such as formula, milk, juice or sodas is a leading cause of early childhood caries.

The results of the research being conducted by the MSU and UM scientists will help parents and other care providers avoid practices that cause caries, according to Columbus dentist Dr. David Curtis, one of the consultants for the oral health care initiative.

"Dental caries is the most prevalent chronic disease of children, five times more common than asthma," he said. "Oral disease results in more missed school days than any other single chronic disease."

Curtis, the current president of the American Academy of Pediatric Dentistry (AAPD), added that the daycare center research is important in educating individuals responsible for children's oral health care.

"The importance of the research really boils down to intervention and prevention," he said. "At the AAPD, we believe proper education and training of primary caregivers, including parents, daycare workers and teachers, can result in a significant improvement in oral disease in children, but we need more data to support that supposition."

The research in the Delta will provide important information for education and training programs, according to Southward.

"Finding ways to prevent health problems before they begin is a primary goal," she said. "Mississippi has some of the worst health outcomes in the nation, and what we learn here can have far-reaching implications for the state and the nation."

MAFES social scientist Linda Southward and Dr. David Curtis prepare questionnaires for use in the project.

Jim Lytle

Bob Ratliff

Producer advisory meetings help set priorities

Each year, hundreds of Mississippi producers of agricultural products ranging from sweetpotatoes to beef cattle come together to discuss and voice their research and education needs.

MAFES Associate Director Marty Fuller addressed the Central Advisory Council.

Bob Ratliff

By Bob Ratliff

The 2003 producer advisory meetings were held in at the North Mississippi Research and Extension Center in Verona on Feb. 27 and at the Central Mississippi Research and Extension Center in Raymond on March 7.

"The 2003 meeting was the 50th time north Mississippi agricultural producers have met to discuss their needs," said North Mississippi Research and Extension Center head Reuben Moore. "It is the oldest such group in the state."

During the morning session at Verona, more than 200 north Mississippi producers divided into 13 commodity groups to discuss the research needed to support their enterprises and the Extension programs that apply to their operations. MAFES personnel and MSU Extension specialists were on hand to answer questions and participate in the discussion.

Following a catfish lunch, representatives of the various commodity groups presented a summary of their discussions.

The vegetable group presentation was made by Union County producer Ralph Hanskiewicz, who said the group would like to see more research on new varieties, additional Extension resource people and more in-depth education on vegetable growing. The turf producers were represented by Harry Collins of Lee County. He discussed the need for a sod producers association and development of a shade-tolerant sod. He also noted that the producers would like to see development of a statewide marketing program for their products.

North Mississippi swine producers want continued support for the Wiley L. Bean Swine Demonstration Unit at the Pontotoc Ridge-Flatwoods Branch Experiment Station, according to Montgomery County producer Jerry Milner. The swine producers also asked that vacant animal science teaching and research positions at MSU be filled.

The seed improvement program is a key element in north Mississippi's sweetpotato industry, said producer representative Tim Edmondson of Calhoun County. He added that the producers also support continued marketing research.

Ornamental producer representative Gene Penick of Noxubee County said long-term evaluation of woody perennials and annuals is an important research program for the ornamental industry. He said his group also supports university efforts to educate the public about soil testing and soil amendments.

North Mississippi grain producers want evaluations of corn insecticides in no-till and conventional cropping systems, according to Lee County producer Keith Wiseman. He also stressed the need for continued soybean variety trials and research to rate soybean varieties for harvestability.

Oktibbeha County fruit producer Charles Sciple said his group needs research to evaluate the cold hardiness of peach varieties, as well as additional research with new fruit crops. The producer group also pointed out the need for a university resource person for fruit.

The need to fill university positions in their area also was discussed by the forestry group, according to representative Larry Jarrett of Pontotoc County. Additional education opportunities and economic issues also are concerns of the forestry group, he said.

The need for an Extension horse specialist was discussed in the equine group, said representative Beverly Jones of Oktibbeha County. Additional information to help horse owners be proactive in getting necessary vaccinations also is needed, she said.

Crossbreeding research for heat tolerance and other desirable traits is one of the needs of the north Mississippi dairy industry, said group representative Jeremy Graham of Pontotoc County. He said research with heel warts and other foot problems is needed, as well as additional studies with baleage versus grazing.

North Mississippi cotton producers would like to see research with seed coatings that would delay emergence until optimum conditions are present, said Lafayette County producer Don Waller.

Marketing is the key issue for the beef industry, said Tippah County producer Dale Robertson. The beef producers also discussed the need for an animal science nutrition specialist at MSU and a midseason meeting for their group at the Prairie Research Unit.

Better access to disease diagnostics services is a major concern among aquaculture producers in northeast Mississippi, said representative Jay Schmidt of Chickasaw County. He added that producers also would like to see additional research with species that would provide alternatives to catfish.

The 2003 meeting marked the seventh time the Central Mississippi Research and Extension Agricultural Advisory Council has come together.

Bob Ratliff

"The Advisory Council gives central and south Mississippi producers an opportunity to discuss their research, marketing, and education needs and to communicate those needs to the people in charge of the research and Extension programs."

Butch Withers, head of the Central Mississippi Research and Extension Center.

Almost 200 producers, industry leaders, Extension personnel, and MAFES scientists, representing six production areas met in breakout sessions during the morning and reported the results of their discussions during an afternoon general session.

The beef cattle report was given by MAFES animal scientist Rhonda Vann, who said the group discussed the possibility of a master cattleman program. The producers also discussed how country-of-origin-issues are impacting their industry and the need for research aimed at reducing winter feeding costs.

Walthall County Extension director Lamar Adams reported on the dairy group, which discussed nutrient management and water quality issues. The group also discussed dairy research at the Coastal Plain Branch in Newton, the North Mississippi Branch in Holly Springs, and the MSU campus.

The row crops group discussed the need for more cotton, corn and soybean research in south Mississippi, according to Extension area agent John Beale. He added that the group also noted the need for additional work on reducing wildlife damage to soybeans and other row crops.

MAFES horticulturist Bill Evans said the fruits and vegetables group discussed the importance of the digital diagnostic labs that are being established around the state. The importance of variety trials and the need for purple nutsedge control research also were topics in the fruits and vegetables meeting.

The ornamental report was given by Jamie Holland, president of the Mississippi Nursery and Landscape Association. He discussed the economic value of the nursery industry to the state, noting that it accounts for more than 10,000 jobs. He added that the producer group would like to see additional research in the areas of pesticide use and energy consumption, among others.

The forestry group report was given by Extension forestry specialist Glenn Hughes, who said the group discussed the need to educate the public about the benefits of the forest industry. He added that the group emphasized the importance of marketing, especially the development of new forest products markets.

MAFES team studies ultraviolet radiation's impact on cotton


RAJA REDDY

Marco Nicovich

By Bonnie Coblentz

Cotton grown under tanning bed lights may lead to the development of new varieties with tolerance for increased ultraviolet radiation.

Raja Reddy, a MAFES research professor of plant and soil sciences, is collaborating with the U.S. Department of Agriculture on two projects dealing with the depletion of the Earth's ozone layer.

With the first project, he is responsible for the maintenance of an automated monitoring device that collects ground-level ultraviolet-B, or UVB, data, which is transmitted daily to Colorado State University.

The monitor is located on MSU's North Farm, one of 32 such monitoring sites nationwide.

"The mission of the monitoring and research program is to provide ground-level UVB radiation information across the country so that seasonal and daily maps of UVB radiation can be developed," Reddy said. "This information can give warnings about days of dangerously high UVB radiation levels and can be used to interpret and correct remote-sensing images."

UVB radiation is part of the radiation coming from the sun. Much of these harmful rays are filtered out by ozone in the earth's stratosphere before they reach ground level, but as the ozone layer is depleted by increased levels of chlorofluorocarbons in the stratosphere, more UVB radiation will reach people, plants and animals on the ground.

Chlorofluorocarbons, or CFCs, were developed in the early 1930s and are used in a variety of industrial, commercial, and household applications, including coolants for commercial and home refrigeration units, aerosol propellants, and electronic cleaning solvents. Research has determined that their release is depleting the ozone in the stratosphere.

"CFCs have a very long life in the atmosphere, and they stay there for about 50 to 150 years, destroying the stratospheric ozone layer," Reddy said. "Once the ozone is partially destroyed, the ground levels get more UVB radiation."

In 1987, the industrialized nations of the world agreed in the Montreal Protocol to phase out their use of these ozone-depleting chemicals, and Reddy said progress has already been made in reducing CFC emissions.

Reddy also is the lead researcher for a USDA project to determine UVB radiation's effects on cotton growth, development and yield. UVB is measured in energy units known as kilojoules. Maximum UVB values range from 8 in Mississippi to 11 in New Mexico.

The research is being done at the former USDA Soil-Plant-Atmosphere-Research site on MSU's North Farm. The sealed Plexiglas chambers at the SPAR facility give researchers the unique ability to control and monitor all the environmental variables impacting a crop.

In addition to Reddy, other project members include research scientists V.G. Kakani, Sailaja Koti and Duli Zhao, all of MSU's Department of Plant and Soil Sciences.

Reddy and his colleagues are growing 15 cotton plants per chamber in 10 of the Plexiglas enclosures. The Plexiglas lets natural sunlight in to provide plants with energy for photosynthesis, while keeping ultraviolet radiation out.

"We provide optimum growth conditions except for the one variable—the UVB radiation," Reddy said. "We supply varying levels of UVB radiation through the use of tanning bed bulbs."

Reddy's research exposes the cotton plants to much higher than normal levels of UVB radiation than is predicted to occur in the future and documenting the results. At extreme levels, flowers are smaller and many appear cup-shaped rather than open. Additionally, the number of anthers, or pollen-producing parts of the flower, are reduced. Leaves show distinct patterns of damage in the form of discolored areas.

"We have detected physiological and morphological changes, but we have not yet correlated this damage to yield," Reddy said. "We're trying to develop crop simulation model so we can predict the beltwide impacts increased UVB radiation would have on cotton."

An anticipated result of this research will be the identification of cotton varieties that exhibit a tolerance to increased UVB radiation.

"If some varieties are more tolerant than others, biotech scientists may be able to use this information to build a better breed of cotton for growth in certain locations where UVB radiation is higher," Reddy said.

MSU was chosen to conduct this research because it has one of just three SPAR facilities in the country, and because of its expertise in environmental plant physiology and crop modeling, including a National Center for Atmospheric Research study of global climate changes.

In that study, Reddy's group combined the MAFES cotton simulation model with NCAR's global climate change model to look at the impacts of global warming and atmospheric changes on cotton.

Reddy's group may soon begin similar research at the SPAR facility on the effects of UVB radiation on corn.

Marco Nicovich

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Marco Nicovich

Jim Lytle

Research evaluates waterfowl management in rice

For Mississippi farmers whose lands provide waterfowl hunting sites once the crops are harvested, hunting leases can be a lucrative additional income.

By Bob Ratliff

Mississippi State wildlife scientists are finding, however, that waste rice available to waterfowl in the Mississippi Delta—where duck and geese hunting generates nearly $30 million annually—may not be as abundant as previously thought.

A new study by MAFES and the Forest and Wildlife Research Center is evaluating the effectiveness of several postharvest practices for conserving waste rice for wintering waterfowl.

Funded by the United States Fish and Wildlife Service, the new study, when completed, will provide cost-effectiveness data of the practices, as well as outlining other benefits to landowners.

Richard M. Kaminski, professor of wildlife and fisheries, said previous research documented how wintering ducks and geese were dependent on the Delta's abundant waste rice and other croplands for food.

"In the mid-1990s, it was estimated that nearly 200,000 acres of rice land and about 320,000 total cropland acres were managed for waterfowl on private lands in the Delta," Kaminski said. "The earlier research showed from 140 to 490 pounds of waste rice per acre."

The latest research, he added, "Indicates that the amount of waste rice has decreased to less than 100 pounds per acre."

Kaminski said the declines can be attributed to improved efficiency of grain harvest, increased germination rates in the field, decomposition and consumption by birds and small animals before migrant waterfowl arrive.

Other financial sponsors of the project include the Arkansas Game and Fish Commission; Ducks Unlimited's Institute for Wetland and Waterfowl Research; Mississippi Department of Wildlife, Fisheries and Parks; North American Wetland Conservation Act; and the U.S. Geological Survey's Patuxent Wildlife Research Center in Laurel, Md..

Based at the Delta Research and Extension Center in Stoneville, the MSU study will analyze five treatment scenarios to identify the best two or three.

Kaminski said those practices that seem to be the "best" at Stoneville then will be tested on private rice-producing lands in the region.

"This study will determine whether the costs are met or exceeded by their benefits," Kaminski said.

MAFESPublications

Following is a list of recent bulletins, technical bulletins, and research reports published by the Mississippi Agricultural and Forestry Experiment Station. You may order copies of these publications or view them online (go to MSUcares.com). For more information or to order copies of these publications, send an e-mail to robynh@ext.msstate.edu or write a letter to this address:

MAFES Publications
Office of Agricultural Communications
Box 9625
Mississippi State, MS 39762-9625

Technical Bulletins

(TB228) A Field Guide to Boll Weevil Identification

Research Reports

(Vol. 22, No. 14) Nutrient Characteristics of Pond-Raised Channel Catfish

(Vol. 22, No. 15) Thrips – A Multi-State Survey: Summary of Observations for Arkansas, Alabama, Georgia, Louisiana, Mississippi, and Tennessee

(Vol. 22, No. 16) Effects of Foliar Application of Boron and Dimilin on Soybean Yield

(Vol. 22, No. 17) MS-501, MS-503, MS-510: Insect-Resistant Sweetpotato Germplasm

(Vol. 22, No. 18) Economics of Turfgrass Establishment

(Vol. 22, No. 19) Primitive Cotton Germplasm: Yield and Fiber Traits for 16 Day-Neutral Accessions

(Vol. 23, No. 1) Infrastructure Investment in the Mississippi Horse Industry

(Vol. 23, No. 2) Seed Vigor Testing of Subtropical Corn Hybrids

(Vol. 23, No. 3) Systems to Reduce the Cost of Preconditioning Purchased Calves

(Vol. 23, No. 4) Small Differences in Planting Dates Affect Soybean Performance

(Vol. 23, No. 5) Mississippi Broiler Litter: Fertilizer Value and Quantity Produced

(Vol. 23, No. 6) Johnsongrass and Palmer Amaranth Control in Conventional-Till and No-Till Systems with Roundup Ready Cotton

(Vol. 23, No. 7) Weed Control in Roundup Ready Cotton with Conventional and Minimum Tillage Production Systems

(Vol. 23, No. 8) Lay-by Herbicides for Weed Control in Roundup Ready Cotton

Bulletins

(B1103) Effects of Root-Knot Nematode on Distribution of Amino Acids

(B1104) Arsenic Concentrations in Selected Soils and Parent Materials in Mississippi

(B1105) Investment Analysis of Commercial Variable Rate and Conventional Fertilizer Spreading Systems

(B1106) Forage Species Tolerance to Imazapyr and Imazapic

(B1107) Effect of Weed Control Treatments on Irrigated ESPS Soybean Yield and Net Return

(B1108) A Spatial Inventory of Mississippi's Agribusiness Sector

(B1109) Potential for Multicrop Revenue Insurance to Serve the Needs of Mississippi Crop Producers

(B1110) Nematode Management Investigations in Mississippi, 1999

(B1111) Regional Differences in Consumer Demand for Beef Rib-Eye Attributes

(B1112) Effects of Algicides on Eukaryotic and Prokaryotic Algal Numbers on a Bermudagrass Putting Green

(B1113) A Practical Guide to Nutrition, Feeds, and Feeding of Catfish

(B1114) Cotton Producers' Use of Alternative Marketing Strategies: Selected Survey Results

(B1115) Production of the Red Swamp Crawfish

(B1116) Estimated Cost of Producing Sweetpotato Slips

(B1117) Fall Tillage of Soybean Grown on Delta Clay Soil

(B1118) Agricultural Land and Water Use in Mississippi, 1982-98

(B1119) Effect of Different Nozzle Types on Drift and Efficacy of Roundup Ultra

(B1120) Fishy 2000: A Windows-Sensitive Computer Program for Pond-Raised Catfish Production

(B1123) Summary of Precision Farming: Practices and Perceptions of Mississippi Cotton

(B1124) Thrips on Mississippi Seedling Cotton: Pest Overview and 15-Year Summary of Pesticide Evaluation

(B1125) Economic Potential of a Cotton-Corn Rotation

(B1126) Attitudes of Small Beef Producers Toward Selected Production and Marketing Practices

(B1127) The Respiratory Outbreak in Mississippi Broilers During 1998

(B1128) Attitudes of Large Beef Producers Toward Selected Production and Marketing Practices

Marco Nicovich

Livestock Production Sale Marks 20th Anniversary

The 2002 MAFES Livestock Production Sale was a milestone for the annual event.

The Nov. 21 sale at the Mississippi Horse Park and Agricenter was the 20th time students in Mike Boyd's Managing Livestock Class have put together the sale of surplus livestock from MAFES herds.

"When we began in 1982, I never thought we would make it through that first sale, much less 20 years," Boyd said. "Over the years, the sale has generated more than $2 million, which has gone back into MAFES livestock research programs."

Students are responsible for most aspects of the production sale except the auctioning, which for the 2002 sale was handled by auctioneer Jackie Courson.

The 2002 sale included 20 horses and 121 lots of cattle. It generated bids totaling more than $116,000 from 170 buyers.

Marco Nicovich

Bob Ratliff

Greenhouse holidays

More than 80 varieties of poinsettias used in research were on display during the December open house at the MSU greenhouses on Stone Boulevard. The public event also includes a seasonal plant and wreath sale, as well as classes on holiday design and plant care. MAFES, the University Florist, the plant and soil sciences department, and the MSU Extension Service sponsor the annual open house.

Bob Ratliff

Bob Ratliff

Coastal R&E Center construction under way

Coastal Research and Extension Center head David Veal, left, and Dwight Speirs with Fletcher Construction check the progress of the center's new $3.7 million home in Biloxi.

The almost 24,000-square-foot facility, slated for completion in September, will house offices, laboratories and two distance learning centers.

"One of the distance learning centers will be available for extensive use by public school systems, allowing students to interact with faculty and other resource personnel at MSU," Veal said.

The architect for the project is Slaughter/Allred/McNabb of Pascagoula.

Calendar of Upcoming Events

June 3-5, 2003	**MID-SOUTH GREENHOUSE GROWERS CONFERENCE** Eagle Ridge Conference Center, *Raymond*
June 6	**GRASSLAND SCHOOL** Brown Loam Branch, *Raymond*
June 7	**HAY DAY** Brown Loam Branch, *Raymond*
Aug. 13	**COTTON FIELD DAY** Delta Research and Extension Center, *Stoneville*
Aug. 14	**RICE/SOYBEAN FIELD DAY** Delta Research and Extension Center, *Stoneville*
Sept. 20	**NORTH MISSISSIPPI GARDEN EXPO** North Mississippi Research and Extension Center, *Verona*

UPDATES

MSU institute head joins agriculture task force

The director of a Mississippi State University institute has been named to a U.S. Department of Agriculture task force.

Agriculture Secretary Ann Veneman appointed Alan Wood, director of the Life Sciences and Biotechnology Institute, to the eight-member Research, Education and Economics Task Force. The group is comprised of scientists from a variety of disciplines, including medicine, agriculture and biotechnology.

The 2002 Farm Bill created the task force, which is conducting a review of USDA's Agricultural Research Service to evaluate the merits of establishing one or more national institutes focused on food and agricultural science. It will report its findings to Veneman and the U.S. House and Senate Agriculture Committees by the fall of 2003.

Wood received his bachelor's degree in biology from Middlebury College in Vermont and a master's and doctorate in virology from Purdue University.

He came to MSU in 2001 as the first director of the Life Sciences and Biotechnology Institute. His previous work includes biologically based pest management research at the Boyce Thompson Institute at Cornell University and leadership of a U.S. Forest Service team studying the use of biological pest control agents in forests.

Marco Nicovich

Biological engineer Joel D. Bumgardner, left, and visiting researcher Frank Walboomers prepare cells for use in a study of how mechanical loading by implant devices affects surrounding bone tissues. Dr. Walboomers conducted research in MSU's Department of Agricultural and Biological Engineering during a three-week visit from the University Medical Center in Nymegen, the Netherlands. He is an assistant professor in the center's Biomaterials Department, headed by Dr. John A. Jansen.

NIH grant supports dental implant research

A National Institutes of Health grant is funding a project by MAFES biological engineer Joel Bumgardner to study the effects of mechanical loading by dental implants on adjacent bone and bone cells. The grant is through the NIH's National Institute of Dental and Craniofacial Research.

Co-investigators for the project are MAFES biological engineers Steve Elder and Jerome Gilbert.

The information being generated by the NIH-supported research, Bumgardner said, will be important in designing bone implants.

"When an implant is placed in bone, it changes the local biomechanical environment, which in turn affects bone response," he said. "Since tissues grow in intimate contact with implant surfaces *in vivo*, it is essential to study how cells respond to implant surface strains under well characterized loading conditions."

Marco Nicovich

LOU D'ABRAMO

2002 Outstanding MAFES Worker

The recipient of the 2002 Outstanding MAFES Worker Award has a succinct explanation of his goal during almost two decades of aquaculture research.

"A lot of what we do is aimed at making producers more efficient with the intent of improving economic return," said MAFES aquaculturist Lou D'Abramo.

With that goal in mind, D'Abramo's 19-year career at Mississippi State has focused on research that provides economical alternatives for catfish and other aquaculture producers to introduce diversity and more competitive crop products for the aquaculture industry.

In presenting the award at the annual MAFES/MSU Extension Service Conference, Mississippi Chemical Corp. Vice President Joe Ewing noted, "Not content to just do the research and publish the results, though he is an accomplished author and editor, he wants commercial producers to see the results and to have their input into the next experimental steps."

D'Abramo, a past-president of the World Aquaculture Society, has developed several diets and feeding strategies for shellfish and finfish that have resulted in lower production costs. His breakthrough research in larval fish and shrimp feeds through successful substitution of live feeds with cost-effective formulated diets is a significant step toward solving one of the principal problems that has chronically limited progress in the global aquaculture industry.

His research results are being put into practice at Nature's Catch, a hybrid striped bass production facility in Clarksdale, Mississippi. He also has developed new management practices for crayfish with the potential to allow producers to almost quadruple the current per-acre production of these crustaceans in the Louisiana industry. The crayfish production practices are now in a commercial verification phase in Mississippi and Alabama.

D'Abramo, however, does not embrace the "more is always better," philosophy.

"Current aquaculture practices in the United States need to evolve to a different level," he said. "We must not only diversify and be innovative in product technology, but also concentrate on efficiency through wise use of available natural resources, through the prevailing goal of improving environmental stewardship."

With that in mind, he is continuing his research with hybrid striped bass, prawns and other species with the potential to offer diversity and efficient use of resources to traditional aquaculture enterprises, including catfish production.

His freshwater shrimp research has played an important role in the more than 300,000 pounds of freshwater shrimp that were produced in the United States in 2002, culminating in the formation of the Freshwater Prawn and Shrimp Growers Association, which includes members in Mississippi and five other Southern states, in early 2002.

The annual Outstanding MAFES Worker Award is sponsored by Yazoo City-based Mississippi Chemical Corp., which produces and markets the three primary crop nutrients used by farmers for high-yield agriculture: nitrogen, phosphorus and potassium.

Experiment Station

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