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THE INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES MAGAZINE | VOL. 24 NO. 1 | SPRING 2008


UF | UNIVERSITY of FLORIDA

# perspective

**AS WE ADDRESS THE CHALLENGES OF A NEW YEAR,** it is important to note that 2007 was highly successful for UF's Institute of Food and Agricultural Sciences. Thanks to our outstanding faculty, students and staff, new levels of performance were achieved in our statewide teaching, research and extension programs.

For example, more than 5,000 students — including record numbers of women and minority students — were enrolled in the College of Agricultural and Life Sciences. Sponsored research and education awards reached a new high of $93.5 million, and matching support from county governments for extension education programs was stronger than ever, almost $40 million. Alumni and friends also continued to play a huge role in the success of IFAS programs. They have given generously to the Florida Tomorrow Campaign — with more than $62 million given to IFAS thus far in the campaign.

Now, with a changing economy, higher energy prices and state revenue shortfalls, we face difficult times in a growing state. Having faced budget reductions earlier this fiscal year, we expect another substantial reduction in our budget this year.

Fifty years ago, Florida's population was approximately five million. Today there are more than 18 million people living in the state. In the next 50 years more rural lands will be converted to urban use, and development may surround land now used for agriculture, forest and natural resources, or conservation areas. This growth will have an impact on agriculture and the environment, including greenspace, water and other natural resources, and energy. We are conducting research and extension programs to inform the discussion and lead to better land and water use decisions for a sustainable Florida. And we are preparing the next generation of scientists and industry leaders for the agricultural and natural resources economy.

I am serving on a task force convened by John Hoblick, president of the Florida Farm Bureau. The vision statement that we have developed for our work is that in 100 years, agriculture will remain a major economic pillar of Florida's economy and benefit Florida citizens.

While changes present many challenges, IFAS has a unique mission to provide research-based solutions for issues related to agriculture, natural resources, land use and renewable energy. IFAS is committed to the future growth and sustainability of Florida's $101 billion agricultural and natural resources industries in the global economy.

With your continued support, IFAS will meet the challenges and opportunities for generations to come. Our faculty, students and programs will continue to earn national and international preeminence while serving Florida's needs.

Sincerely,

JIMMY G. CHEEK
*Senior Vice President*
*Agriculture and Natural Resources*
*University of Florida*

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IFAS

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## FEATURES



## NEWS UPDATES



## PEOPLE, PLACES AND THINGS



## On the Cover

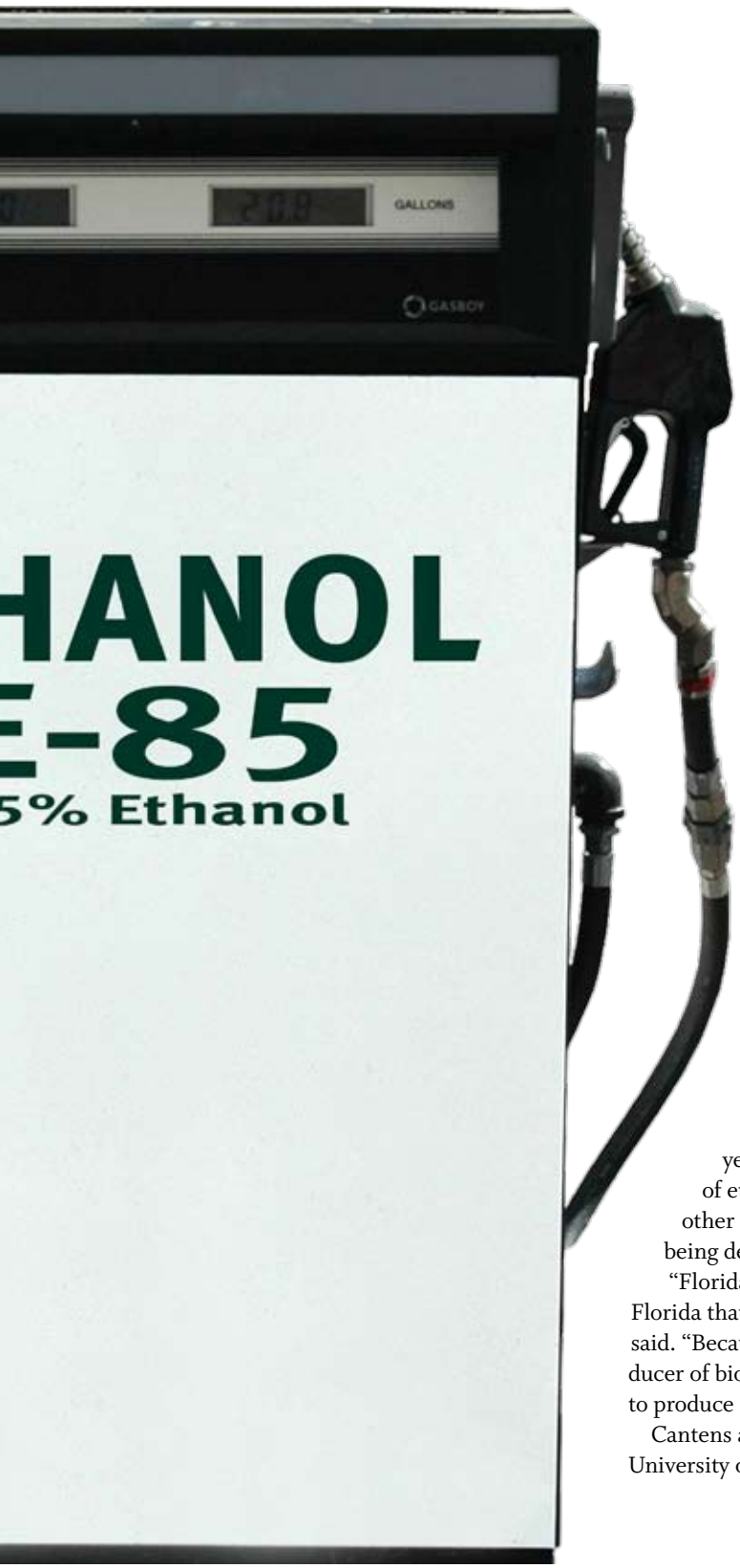
Citrus canker continues to be a serious disease for Florida's $9.3 billion citrus industry, but citrus greening is now a more worrisome threat — and the top citrus research and extension education priority for UF's Institute of Food and Agricultural Sciences. The two diseases are an unprecedented challenge for the industry, and IFAS is responding with expanded research and education programs. FOR MORE INFORMATION, PLEASE SEE PAGE 8. PHOTO BY THOMAS WRIGHT

FEATURE

# A BIG BOOST FOR BIOFUELS

*Research by UF's Institute of Food and Agricultural Sciences on ethanol and other biofuels is attracting international attention. UF's breakthrough technology for producing fuel ethanol from plant waste is being commercialized by Verenium Corporation in Cambridge, Mass., and a new ethanol research and demonstration facility in South Florida will be operated by UF in cooperation with Verenium and Florida Crystals Corp. The bioconversion technology is also being used by BioEthanol Japan in Osaka.*

Jimmy Cheek, left, UF senior vice president for agriculture and natural resources; Lonnie Ingram, UF distinguished professor of microbiology; and Tim Eves, vice president for business development at Verenium Corp., celebrate the first royalty payment from Verenium to UF for use of cellulosic ethanol technology developed by Ingram. Speaking at the second annual Farm to Fuel Summit in St. Petersburg, Fla. in July 2007, Eves said the royalty payment represents the beginning of profitability for the technology. **PHOTO BY THOMAS WRIGHT**




Florida State Rep. Larry Cretul, left, and Lonnie Ingram discuss state energy needs Jan. 28, 2008 at a new biofuels plant located at UF's Institute of Food and Agricultural Sciences in Gainesville. The research and demonstration facility will improve methods for turning cellulosic biomass, such as crop residues and yard waste, into ethanol. **PHOTO BY THOMAS WRIGHT**

Governor Charlie Crist and members of the Florida House and Senate visited the University of Florida recently to learn more about a breakthrough technology that will produce fuel ethanol from biomass at a new $20 million research and demonstration facility in South Florida.

During their visits, they met with UF faculty, staff and students, including Lonnie Ingram, a distinguished professor of microbiology in the Institute of Food and Agricultural Sciences who developed the bioconversion technology for creating ethanol from plant waste.

Ingram's technology — genetically engineered *E. coli* bacteria — produces fuel ethanol from inedible plant biomass, such as sugarcane residues, rice hulls, municipal green waste, forestry and wood wastes and other organic materials.

The demonstration plant, funded by the 2006 Florida Legislature, is designed to further the technology of making ethanol from biomass. The facility will be owned by UF and operated in partnership with Florida Crystals Corp. in West Palm Beach, Fla. and Verenium Corp. based in Cambridge, Mass. Verenium holds an exclusive license to the UF technology.

Gaston Cantens, vice president of corporate relations for Florida Crystals, said the plant will be located in Okeelanta, near Belle Glade, and the facility is expected to be operational within two years. It will be utilized as a research facility to explore the production of ethanol from a variety of inedible biomass, including sugarcane and other crop residues, hardwoods and softwoods as well as new energy crops being developed in Florida.

"Florida Crystals believes there's a bright future for renewable energy in Florida that can help alleviate America's dependence on foreign oil," Cantens said. "Because of the industries native to the state, Florida is the largest producer of biomass in the country. Florida Crystals has been using biomass as fuel to produce renewable energy for more than a decade."

Cantens added, "We believe our cellulosic ethanol partnership with the University of Florida is an important step in securing clean, reliable energy

Lonnie Ingram holds a petri dish containing the bacterium that produces ethanol from biomass. Greg Luli, standing, vice president for research and development at Verenium Corp., said the firm has an exclusive license from UF to use the bioconversion technology, which has attracted international attention. It is being used in South Florida, Louisiana and Japan. **PHOTO BY THOMAS WRIGHT**

sources for our country. Using biomass, Florida can be a leader in renewable fuel production."

Ingram, who directs the Florida Center for Renewable Chemicals and Fuels at UF, estimates that Florida produces as much as 124 million tons of biomass each year — enough to make 10 billion gallons of ethanol, which is more than double the 4.8 billion gallons now made mostly from corn nationwide. Converting biomass to fuel ethanol could replace half of the imported petroleum in the United States, he said.

"With the cost of imported fuel reaching record highs, we can use this new technology to produce ethanol for about $1.30 per gallon," Ingram said. "Ethanol will stretch the nation's fuel supply and make gasoline burn more cleanly. Gasoline-ethanol blends also boost the octane rating of automotive fuel."

Ingram, who briefed President Bush and members of Congress in April 2007 about the technology, said his genetically engineered bacteria are capable of converting all sugar types found in plant cell walls into fuel ethanol. Until now, all of the world's fuel ethanol has been produced from high-value materials such as corn using yeast fermentations.

A member of the National Academy of Sciences, Ingram said he genetically engineered the two organisms by cloning the unique genes needed to direct the digestion of sugars into ethanol, the same pathway found in yeast and higher plants. These genes were inserted into a variety of bacteria that have the ability to use all sugars found in plant material, but normally produce a worthless mixture of acetic and lactic acids as fermentation products. With the ethanol genes, the engineered bacteria may have the potential to produce ethanol from biomass sugars with 90 percent to 95 percent efficiency.

The governor called Ingram a pioneer and said that there is a real opportunity for Florida to be a national leader in developing alternative fuels and reducing vehicle emissions. Ingram's work resulted in the first royalty check from Verenium to UF for the bioconversion technology that was selected to by the U.S. Department of Commerce to become landmark U.S. Patent No. 5,000,000 in 1991.

Geoffrey Hazlewood, senior vice president of research at Verenium, said the firm is on track to complete its 1.4 million gallons per year biomass-to-ethanol demonstration facility in Jennings, La., at the end of March 2008. In addition, the technology, licensed by Verenium to Murabeni Corp. and Tsukishima Kikai Corp., Ltd. in Japan, has been incorporated into BioEthanol Japan's 1.4 million liters per year (about 370,000 gallons) cellulosic ethanol plant in Osaka to produce ethanol from wood waste.

## Grant Support

In March 2008, IFAS received an $866,576 grant from the U.S. Department of Energy and Department of Agriculture for the genetic engineering of sugarcane to increase its output of fermentable sugar. Required non-federal matching support, including funds from Florida

Crystals, will boost total funding for the research project to $1,083,220.

"The research will support efficient conversion of sugarcane residues to ethanol, thereby reducing raw material costs, enhancing productivity and sustainability," said Fredy Altpeter, an assistant professor in UF's agronomy department and leader of the project. "It will also support the commercial production of biofuels at prices competitive with fossil fuels."

Faculty working with Altpeter on the project include Maria Gallo, a professor in the agronomy department; Wilfred Vermerris, an associate professor in the department, and James Preston, a professor in the microbiology and cell science department.

Additional support for biofuels research comes from the U.S. Department of Energy, which awarded a $750,000 grant in August 2007 to IFAS for developing sweet sorghum as an ethanol feedstock. Wilfred Vermerris, leader of the research project, said sorghum — a plant species related to corn and sugarcane — is an attractive biomass crop because it grows well under a lot of different conditions and has the capacity to produce a lot of sugar. His genetic research is aimed at identifying and combining desirable plant traits so that sorghum can be used more efficiently for energy production.

## New Biofuels Pilot Plant

As plans move forward for construction of the $20 million ethanol production facility in South Florida, a new biofuels pilot plant is expected to become operational at UF's Institute of Food and Agricultural Sciences in Gainesville in April 2008. In 2007, the Board of Governors of the State Universities of Florida awarded $2 million to establish test facilities for research and development of biofuel conversion processes.

Located in the agricultural and biological engineering department, the pilot plant will develop and improve biofuel conversion processes, including methods for turning cellulosic biomass into ethanol, said Pratap Pullammanappallil, an assistant professor in the department. He will operate the facility in cooperation with Ingram and John Owens, a research scientist in the microbiology and cell science department.

"The laboratory will provide facilities to engineer bioprocesses for the conversion of various biomass feedstocks to biofuels such as ethanol, butanol, biogas, biodiesel and hydrogen," Pullammanappallil said.

"Initially the laboratory will focus on ethanol conversion technologies, and it will be expanded to include equipment for production and testing of other biofuels such as biogas and biodiesel. It is expected that funds for its operation will be provided by the biofuel industry to investigate and develop technologies," he said. ■ — CHUCK WOODS

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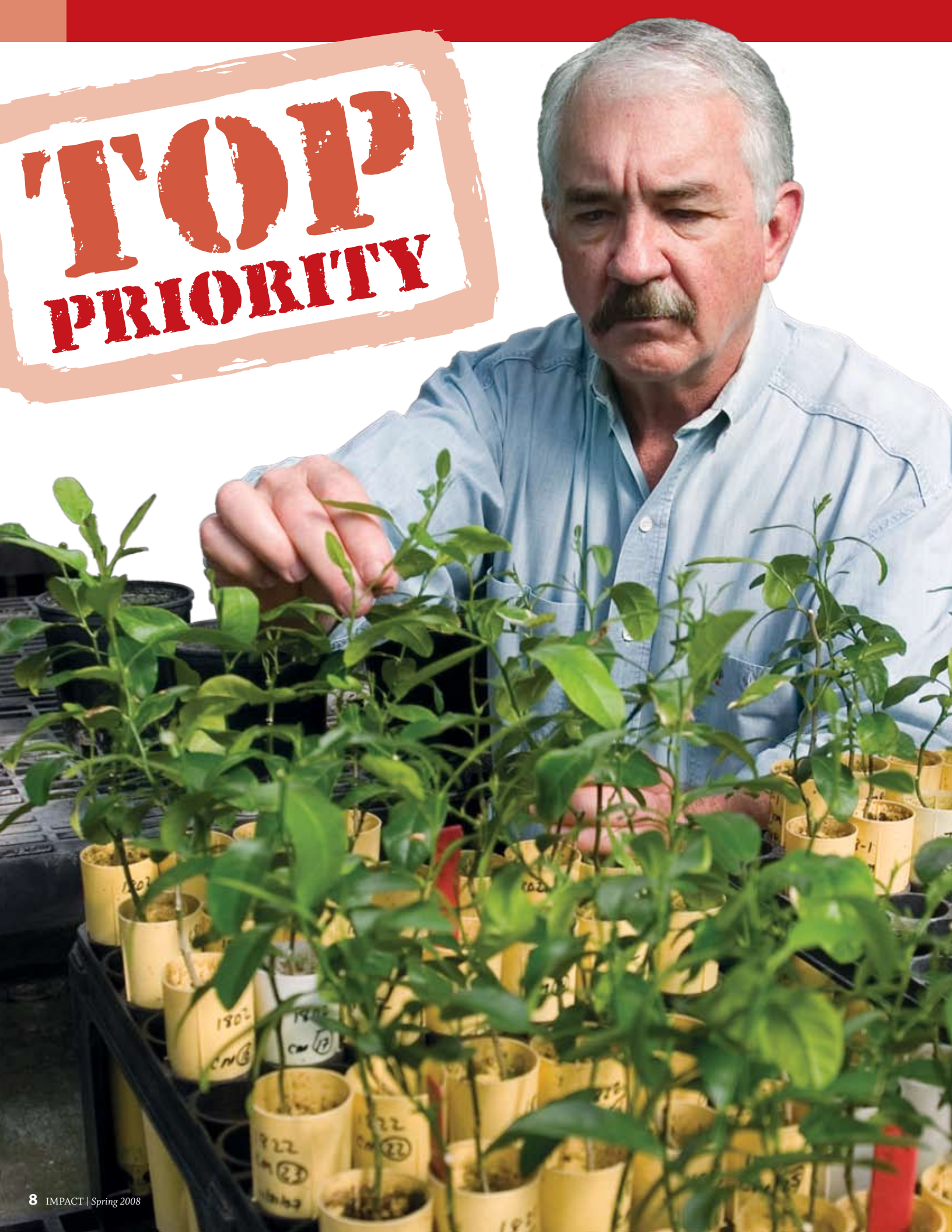
Pratap Pullammanappallil inspects biomass hydrolysis equipment in the new biofuels pilot plant in the agricultural and biological engineering department in Gainesville. PHOTO BY THOMAS WRIGHT

# TOP PRIORITY



Bill Dawson, opposite, a professor of plant pathology and eminent scholar at UF's Citrus Research and Education Center at Lake Alfred, examines citrus seedlings to determine how they respond to the greening bacterium. Dawson, who is screening a wide range of citrus varieties and citrus relatives, has not found any citrus trees that are resistant to the bacterium, but some trees have less severe symptoms than others. "We are trying to learn why these trees are able to tolerate the bacterium with a limited amount of disease, with the hope that this information could be used to produce commercial varieties that tolerate the disease," he said. "We also are screening proteins and peptides for their ability to prevent production of the disease by the bacterium or to prevent its transmission by the Asian citrus psyllid insect vector." **PHOTO BY TYLER JONES**

Michaels Rogers, left, Tim Spann and Ron Brlansky examine citrus trees for symptoms of citrus greening and the presence of the Asian citrus psyllid that transmits the pathogen. **UF/IFAS FILE PHOTO**

*Citrus canker continues to be a serious disease for Florida's $9.3 billion citrus industry, but citrus greening is now a more worrisome threat — and the top citrus research and extension education priority for UF's Institute of Food and Agricultural Sciences.*

In the long term, the Florida citrus industry can live with and manage the canker problem, but citrus greening is a fatal disease that's an even larger threat to the state's signature crop, says Harold Browning, director of UF's Citrus Research and Education Center in Lake Alfred.

"While our ongoing research and education programs to manage citrus canker are still very important, we are launching new and expanded efforts to control greening — thanks to support from the Florida citrus industry, the state legislature and federal sources."

Browning said the citrus greening problem is being attacked on several fronts: by improving early-detection methods to identify the bacterial disease; developing best management practices for the disease; testing new pesticides and application strategies for existing pesticides; releasing natural predators and parasitoids to control the tiny Asian citrus psyllid insect that spreads the disease; developing transgenic citrus varieties that resist the pest and greening; and expanding UF extension education programs for producers and consumers.

The disease slowly weakens and kills all types of citrus trees and, in some cases, causes fruit to become lopsided and taste bitter. Fruit does not develop the desired color, hence the greening name. Although greening poses no health threat to humans, there currently is no cure for the disease, Browning said.

Transmitted by the Asian citrus psyllid (*Diaphorina citri*) now widely distributed throughout Florida, citrus greening has been found in 27 counties, including most major commercial citrus areas. Browning said it's not practical to eradicate citrus greening, but the spread of the disease can be slowed with an effective integrated pest management program that includes limited use of insecticides, beneficial insects that attack the psyllid and other improved grove management practices.

"What complicates control of citrus greening is the fact that symptoms don't begin to show up in trees until several months after the trees are infected by the psyllid insects," said Ron Brlansky, a professor of plant pathology at UF's Lake Alfred center. "Lack of early detection of the systemic bacterial disease is a major problem for the citrus industry — once the symptoms show up, it's too late to save the tree."

He said early symptoms such as leaf mottling and yellow discoloration may be mistaken for other problems such as nutritional deficiencies, and improved laboratory tests are needed to determine if greening is the problem. The disease can also be identified by cutting open small and poorly colored fruit and looking for aborted seeds.

Brlansky is working with Michael Rogers, an assistant professor of entomology at the Lake Alfred center, to investigate the interaction between the Asian citrus psyllid and the citrus greening pathogen (*Candidatus Liberibacter asiaticus*). They are also determining if the transmission of the greening pathogen can be reduced through the use of insecticides, particularly systemic insecticides.

Unlike broad-spectrum insecticides that are applied to the foliage of citrus trees, soil-applied systemic insecticides are less likely to impact other beneficial insects that control citrus pests in existing biological control programs, Rogers said.

"Recent results in our field trials have demonstrated that soil-applied systemic insecticides can reduce psyllid populations on mature citrus trees and provide a significantly longer period of control than foliar applications," Rogers said. "These research projects will allow us to manage psyllids with fewer pesticide applications than growers use in other regions of the world where greening is a problem."

Brlansky said other projects are also underway to learn more about the transmission of the greening pathogen by the psyllids. Researchers are looking for answers to questions such as: how long must a psyllid feed to acquire the pathogen from an infected plant, how long must an infected psyllid feed on a healthy plant before it transmits the pathogen to the plant, can the pathogen be passed from mother to offspring, can the psyllid acquire the pathogen from plants that are infected but not yet showing disease symptoms, and what is the percentage of psyllids likely to be infected with the greening pathogen at different times of the year?

Meanwhile, a new collaborative diagnostic laboratory operated by U.S. Sugar Corp. and UF in Clewiston is helping growers improve their ability to detect the disease, and state funds have been allocated for a new diagnostic laboratory at UF's Southwest Florida Research and Education Center in Immokalee. The Immokalee lab, part of the Florida Extension Plant Disease Clinic, is being managed by Pamela

Adult Asian citrus psyillid

Immature stages of psyllid feeding on citrus leaves

Chlorosis on citrus leaves infected with citrus greening

Small, lopsided fruit from greening-infected citrus tree

Citrus canker lesions on leaves

Citrus canker lesions on fruit

PHOTOS BY MICHAEL ROGERS

Pam Roberts, left, and Phil Stansly examine citrus at the Southwest Florida Research and Education Center in Immokalee for greening symptoms and the presence of the Asian citrus psyllid that spreads the disease. **PHOTO BY THOMAS WRIGHT**

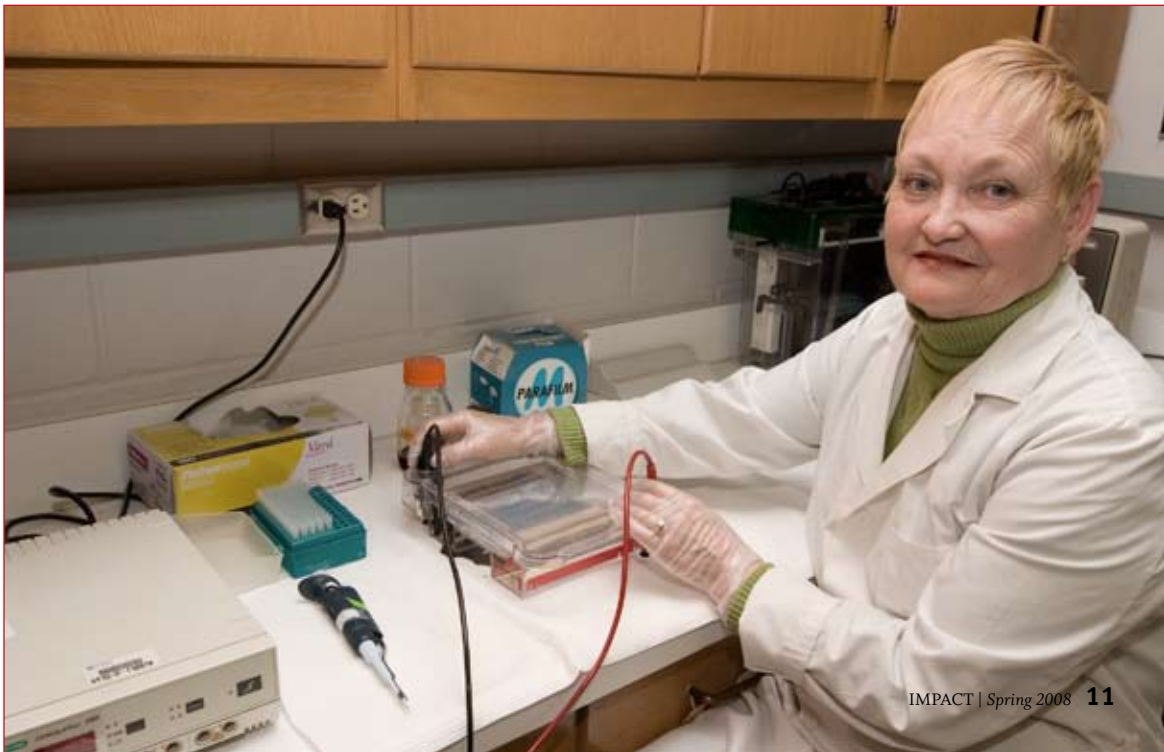
Roberts, an associate professor of plant pathology, in collaboration with Diana Schultz, an assistant in plant pathology with advanced training in molecular biology.

## Biological Control

In an attempt to reduce populations of the psyllid, Marjorie Hoy, a professor of entomology and eminent scholar, and Ru Nguyen, an entomologist with the Division of Plant Industry (DPI) at the Florida Department of Agriculture and Consumer Services in Gainesville, imported and released two natural enemies of the citrus pest from Taiwan and Thailand in 1998. One of the beneficial wasps, *Tamarixia radiata*, is now widely established throughout Florida, and the second wasp, *Diaphorencyrtus aligharensis*, may be present in very low numbers.

Hoy and her colleagues found that *Tamarixia radiata* — a host-specific natural enemy that attacks immature Asian citrus psyllids — declines during the winter because the psyllid does not reproduce on citrus during cooler weather in Florida. "As a result, populations of Tamarixia lag behind the psyllid when it begins to reproduce in early spring," Hoy said. "Tamarixia increases to higher densities late in the season — August to November — reaching parasitism rates as high as 98 percent."

She said it's unlikely that any host-specific wasp can successfully overwinter in high numbers unless the psyllid




Using a PCR (polymerase chain reaction) technique, Marjorie Hoy evaluated the proportion of Asian citus psyllids in Florida citrus groves carrying the greening bacterium and found a very low incidence of infected psyllids during the fall and winter of 2005-2006. Jason Meyer, not pictured, a graduate student in the entomology and nematology department, assisted with the research. "Our research suggests that it may be more important to remove infected trees than to attempt to kill every psyllid in an effort to reduce transmission of greening disease," Hoy said. **PHOTO BY TYLER JONES**

Jim Graham evaluates the susceptibility of sweet orange varieties to citrus canker after seedlings have been inoculated with the pathogen.
**UF/IFAS FILE PHOTO**

continues to reproduce on citrus or on the orange jasmine plant (*Murraya paniculata*).

"Unfortunately, the orange jasmine plant has been shown to be a host for greening disease, so encouraging populations of psyllids to develop on this common landscape ornamental plant during the winter is not an appropriate strategy for increasing populations of host-specific natural enemies of the psyllid," Hoy said.

She said biological control agents can reduce psyllid populations if the natural enemies are not killed by pesticides, but no biological control agent can eliminate all psyllids and the possibility of transmission of greening disease. Unfortunately, this is also true of pesticides, she said.

The effectiveness of the *Tamarixia radiata* wasp in controlling the psyllid is being evaluated by Phil Stansly, a professor of entomology at UF's Southwest Florida Research and Education Center, in cooperation with Michael Rogers at Lake Alfred and David Hall, an entomologist at USDA's Horticultural Research Laboratory in Fort Pierce.

"With the help of participating growers, the study determined that the beneficial wasp is present in most Florida citrus groves, but does not provide the level of control observed in other countries with warmer winter climates," Stansly said.

"For instance, we saw parasitism that averaged 70 percent — reaching nearly 100 percent — in Puerto Rico, but less than 20 percent during spring and summer in Florida," Stansly said. "This indicates a need for species or biotypes of parasitic wasps that are better adapted to Florida conditions."

Stansly, Hall and Eric Rohrig, an entomology graduate student in UF's College of Agricultural and Life Sciences, are working with a beneficial wasp from China, a biotype of *Diaphorencyrtus aligarhensis*. Field releases of the parasitoid have started in southwest Florida.

Jim Graham, a professor of soil microbiology at the Lake Alfred center, said groves should be carefully checked at least four times a year, particularly during fall and winter months when greening symptoms are most prevalent. Groves should be sprayed at least five times a year with a pesticide to control the psyllid population. However, research needs to be conducted to determine how compatible these products are with natural enemies. When greening is confirmed, immediately remove the infected tree to prevent the disease from spreading, he said.

## Biotechnology

Dean Gabriel, a professor of plant pathology and plant molecular and cell biology, said his work on citrus greening includes detection of reservoir hosts, other than citrus, where greening may be harbored and accidentally shipped to citrus growing areas that are currently greening-free. His research, performed in collaboration with DPI, showed that the orange jasmine plant can be a carrier host for citrus greening in Florida.

In a second collaborative effort with DPI, he is working to determine if heat treatment of budded citrus can be used to cure greening. If heat can be used to cure greening, it would help ensure the safety of Florida's nursery stock at low added cost, Gabriel said.

In a third research project, funded by USDA's Animal and Plant Health Inspection Service, Gabriel is attempting to obtain the DNA sequence of the citrus greening bacterium. "If the genome of the greening organism could be determined, it would reveal all of the genes that the greening bacterium possesses and enable prediction of the organism's weaknesses and strengths," Gabriel said. "This allows more rational design of control strategies and also provides potential molecular targets for chemical controls."

With support from USDA-APHIS, Gabriel is also working to improve detection of greening. "We are attempting to determine if Florida has a new and previously unknown strain of the citrus greening bacterium, in addition to the known Asiatic strain of greening currently confirmed," Gabriel said.

Dean Gabriel examines sweet orange trees infected with a strain of citrus greening that is being continuously propagated and maintained at the IFAS plant containment facility in Gainesville. His laboratory is working to isolate and purify enough DNA from this strain to enable sequencing of the bacterial pathogen's genome. **UF/IFAS FILE PHOTO**

"This work is a result of the observation that a substantial number of citrus trees that exhibit symptoms of greening appear to be negative for greening by the current DNA-based PCR tests," he said. "Introduction of a new citrus greening strain into Florida in addition to the Asiatic greening strain would not be surprising, since the level of genetic variation within the pathogenic species is unknown, and current tests may be too limited to detect all strains."

Meanwhile, Gabriel said his research on citrus canker is aimed at trying to anticipate new disease variants that may arise in Florida, now that the canker organism has become established and persistent. "When a new bacterium becomes established in an area where it previously did not exist, it has new opportunities to interact with — and combine DNA with — other microbes, sometimes resulting in the emergence of new diseases," he said. "Anticipating new citrus diseases allows more rapid detection and appropriate regulatory and disease control responses."

## Extension Education

In addition to expanded research on citrus canker and greening, the UF Extension Service is providing information on these diseases and their management.

Beginning with information available from other citrus growing regions around the world that have experience with greening, UF extension specialists are developing training tools for detection of greening, scouting methods and procedures, and they are providing training to growers, harvesters and fresh fruit packing operations, said Tim Spann, an assistant professor of horticulture at the Lake Alfred center.

Information from research on psyllid suppression strategies and other production practices is being delivered to industry clients and homeowners through field days, seminars, and electronic and printed materials. "During this period of adjustment to the presence of these diseases in Florida, it is vital that growers and others involved in Florida citrus are apprised of the most current information," Spann said.

The expanded education effort also includes a new monthly e-mail newsletter, "Citrus Industry Update," to improve communication with the citrus industry about UF research on citrus canker, citrus greening and other issues. The newsletter is available at www.crec.ifas.ufl.edu/publications/ciu/index.htm. Or, go to www.crec.ifas.ufl.edu and click on "Citrus Industry Update." ■ **– CHUCK WOODS**

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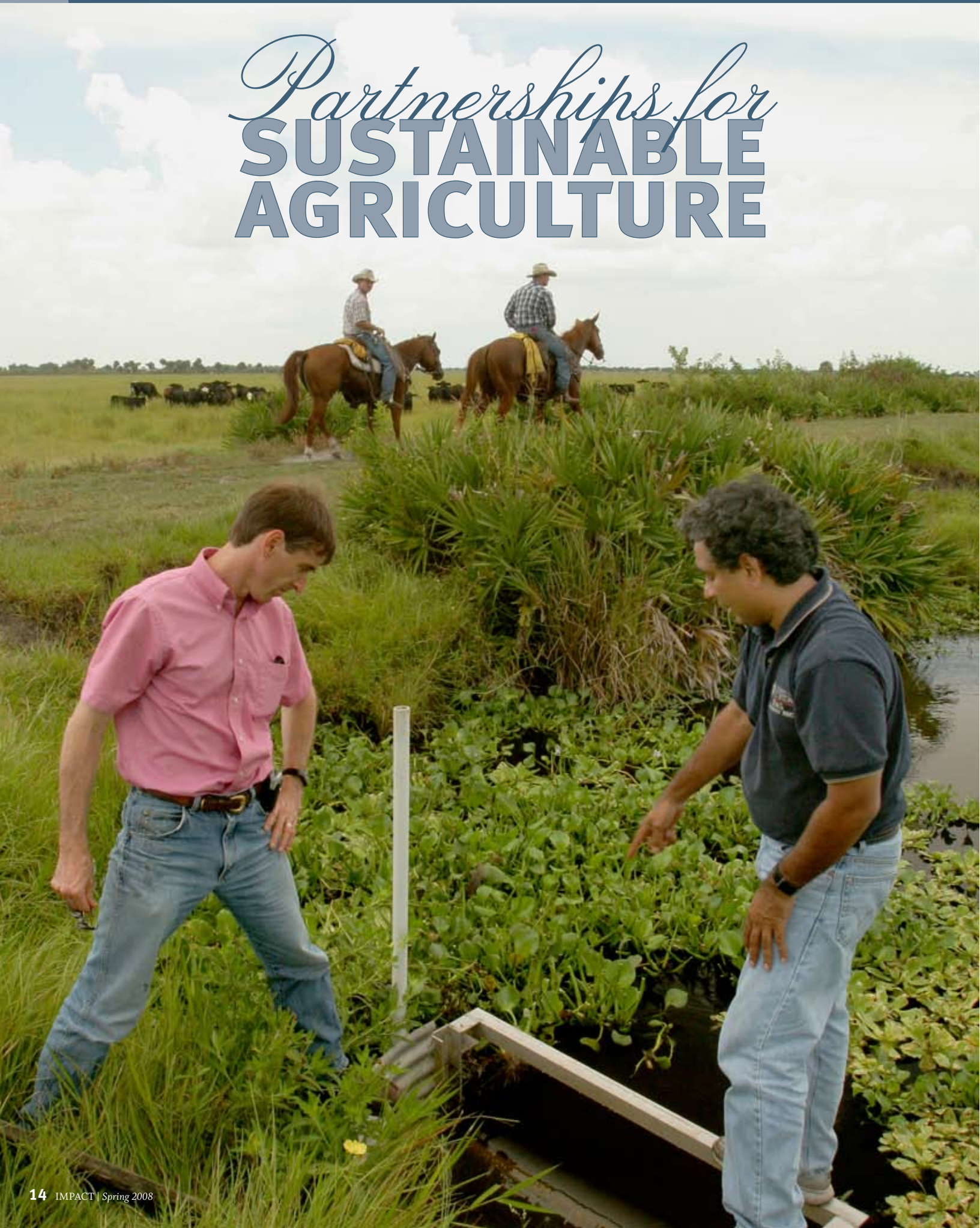
# *Partnerships for* SUSTAINABLE AGRICULTURE



The Everglades ecosystem extends from the Kissimmee River Basin to Lake Okeechobee and Florida Bay. Lake Okeechobee — South Florida's "liquid heart" — is the critical link between rivers north of the lake and estuaries and wetlands south of the lake. **PHOTO BY THOMAS WRIGHT**

*As economic and environmental sustainability become key issues in one of the nation's fastest growing states, researchers at UF's Institute of Food and Agricultural Sciences are working with ranchers, other state and federal agencies and World Wildlife Fund to improve water resources and natural habitats in South Florida. The new Florida Ranchlands Environmental Services Project is designing and testing a program that will compensate ranchers who protect the water resources, wetlands and wildlife habitats in the vast Everglades ecosystem that extends from the Kissimmee River Basin to Lake Okeechobee and Florida Bay. These partnerships with ranchers will also create economic incentives for land to remain in ranching instead of being used for urban development — land uses that could further aggravate water quality and other environmental problems.*

Patrick Bohlen, opposite, and Sanjay Shukla inspect one of the culverts at Buck Island Ranch being used to retain on-ranch water. **PHOTO BY THOMAS WRIGHT**

Benita Whalen, left, and Joe Collins, engineering manager for Lykes Bros. Inc., check equipment used to pump water into a reservoir at the firm's property in Glades County. **PHOTO BY THOMAS WRIGHT**

South Florida ranchers could increase their income, thanks to a "pay-for-environmental-services" program that will reward those who help restore and protect one of the nation's largest and most endangered ecosystems.

Over the next two years, the Florida Ranchlands Environmental Services Project will design and test a program that will complement existing state and federal initiatives — such as the Comprehensive Everglades Restoration Plan and the Lake Okeechobee Protection Plan — by paying ranchers to retain water on their land, reduce nutrient runoff and enhance wetland vegetation for wildlife.

"Existing state and federal initiatives are using public funds to buy land and build large treatment wetlands that

remove phosphorus and other nutrients from water on farms, construct large reservoirs to capture rainwater north of the lake and slow its southern movement, and drill wells to store excess water underground," said Sarah Lynch, project director with World Wildlife Fund based in Washington, D.C.

"Now, in an innovative program that would complement these existing restoration efforts, we are trying a new concept — paying ranchers to provide important environmental services that are desperately needed in South Florida," she said. "The pilot project will not pay ranchers to comply with water quality standards already mandated by state and federal programs, but compensates them for retaining water and removing phosphorus above and beyond the required standards."

She said the 5-year research project will develop ways for measuring and documenting the value of these environmental services in order to establish contracts with state agencies and other willing buyers.

Lynch, whose global conservation organization led the development of the project, said a 2005 study showed that buying environmental services directly from ranchers can save taxpayers money and be implemented more quickly than regional treatment facilities and large reservoirs.

"And ranchers, who often face low profit margins and fluctuations in the price of beef, will have another source of stable income, creating a financial incentive for their land to remain in ranching instead of more intensive development," she said. "By sustaining ranches, the project will also sustain rural communities that depend on them."

She said "environmental services" include many of the benefits that people and the planet receive from natural ecosystems. For the Everglades and Lake Okeechobee, this means water purification, water control and wildlife habitat.

"Because we often take these services for granted and they are often considered to be 'free,' the value of this natural capital is not captured in markets or by most economic indicators," she said. "The urgent need to protect and enhance the natural capital that provides these services is driving pay-for-services initiatives such as the Florida Ranchlands Environmental Services Project."

Funding for the $5 million project is coming from the U.S. Department of Agriculture's Natural Resources Conservation Service, the Florida Department of Agriculture and Consumer Services, the South Florida Water Management District and World Wildlife Fund. Other partners include the Florida Department of Environmental Protection and the MacArthur Agro-Ecology Research Center.

The Florida Ranchlands Environmental Services Project is designing and testing a program that will compensate ranchers who protect the water resources, wetlands and wildlife habitats in the Everglades ecosystem. **PHOTO BY THOMAS WRIGHT**

Mark Clark, left, discusses the installation of water quality sampling equipment at Williamson Cattle Co. with Sarah Lynch, Sonny Williamson and his grandson, John Williamson. **PHOTO BY THOMAS WRIGHT**

Technical expertise in measuring and documenting the environmental services is being provided by researchers in UF's Institute of Food and Agricultural Sciences.

Patrick Bohlen, director of research at the MacArthur Agro-Ecology Research Center at Buck Island Ranch in Lake Placid and a courtesy assistant professor in UF's soil and water science department, is helping design and implement water quantity and quality monitoring systems at all participating locations.

He said Lake Okeechobee — South Florida's "liquid heart" — is the critical link between rivers north of the lake and estuaries and wetlands south of the lake.

"The lake currently suffers from excessive levels of phosphorus caused in part by rapid runoff from its extensively drained watershed," Bohlen said. "In 2000, the Florida Department of Environmental Protection established a total maximum daily load of 140 metric tons of phosphorus for the lake, but current loads average 433 to 709 metric tons, requiring a 68 to 80 percent reduction in phosphorus to meet a 2015 target set by EPA."

Mark Clark, an assistant professor in UF's soil and water science department, is monitoring and documenting water management programs at the various sites, including water storage, nutrient retention and wetland improvement.

Sanjay Shukla, an associate professor of agricultural and biological engineering at UF's Southwest Florida Research and Education Center in Immokalee, is helping design the water monitoring systems, as well as developing methods to quantify water and phosphorus storage at the sites.

"Storing water on agricultural land can increase ground water recharge and reduce peak flows of phosphorus to Lake Okeechobee and other downstream areas," Shukla said. "We are developing hydrologic models that will be used in conjunction with water quality data such as rainfall, surface water flows and groundwater levels to determine the amount of water and phosphorus that can be stored at each site."

Four South Florida partners in the lake's watershed have been involved with the project since its 2005 inception: Alderman-DeLoney Ranch in Okeechobee County, Buck Island Ranch in Highlands County, Lykes Bros. Inc. in Glades County and Williamson Cattle Company in Okeechobee County.

In August 2007, four more partners joined the project: C.M. Payne & Son Inc. in Highlands County, Lightsey Cattle Co. in Polk County, Rafter T Ranch in Highlands County, and Syfrett Ranch West in Okeechobee County. All are within the Lake Okeechobee, Caloosahatchee and St. Lucie estuary watersheds.

At the Alderman-DeLoney and Williamson properties, water control structures have been constructed to rehydrate historic wetlands. At the Buck Island Ranch, 41 water control structures have been installed in drainage ditches to retain more water on 3,700 acres of pastureland and thereby reduce phosphorus runoff in the Lake Okeechobee watershed. A 2,500-acre marsh at the Lykes Bros. property, originally created to provide citrus frost protection, will now be used to filter water pumped from the Indian Prairie canal to remove phosphorus before the water is returned to the public canal.

Wes Williamson, who co-owns Williamson Cattle Company with his

father, Sonny, said they have installed a structure that will hold water in a 250-acre former marsh that drains an additional 650 upland acres. "Slowing the drainage will help assimilate much of the phosphorus and store water that would normally enter Lake Okeechobee," he said.

UF researchers are measuring the value of three different environmental services and developing practical methods that are acceptable to the buyer and seller, Clark said.

The water retention service will hold water in ranch soils, low-lying areas and ditches during high rainfall. The service has value because it changes the volume, pattern and timing of water flow in the Lake Okeechobee watershed, thereby reducing peak discharges into coastal estuaries.

"The phosphorus load retention service will help address phosphorus loading targets and has value because it will increase oxygen levels in the lake, limit algal blooms and protect fish," he said.

"The wetlands habitat expansion service often comes in conjunction with practices to retain more water and has value because it helps reverse the loss of wetlands to drainage, thereby improving the habitat for wildlife," Clark said.

Shukla said the first step in the design of a pay-for-environmental-services program is assuring that state agencies and others who buy the services — and the ranchers who sell them — agree on the definition of services.

"Once these services are defined, knowing what to measure and what to do with the data becomes critical," he said. "We can collect all sorts of data from these sites, but the key to an eventual large-scale application of this concept will be to develop a method that can quantify the environmental services with reasonable accuracy and do it at a relatively low cost."

Richard Budell, director of the office of agricultural water policy with the Florida Department of Agriculture and Consumer Services, said the pilot project will also help address important questions such as how to establish a dedicated, multi-year funding source to pay for environmental services provided by ranchers, how to establish what prices will be paid for services and how to integrate the new pay-for-services program with other state and federal programs in the Everglades region.

Benita Whalen, director of the South Florida Water Management District's Okeechobee Service Center, said the projects will allow water storage on private land north of Lake Okeechobee, thereby helping reduce inflows to the lake and discharges into coastal estuaries, which is one of the northern Everglades initiative goals. "The water management district is committed to developing innovative solutions that will provide benefits to the environment," she said. ■

– CHUCK WOODS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At the Lykes Bros. Inc. property in Glades County, water is pumped from the Indian Prairie canal into a 2,500-acre marsh, which filters the water and removes phosphorus before the water is returned further downstream to the public canal. **PHOTO BY THOMAS WRIGHT**

# Eliminating the EVIL WEEVIL

## Invasive Pest

A bug known as the "evil weevil" may have met its match.

Since 1989, the invasive Mexican bromeliad weevil (*Metamasius callizona*) has wreaked havoc on the state's native bromeliads, but researchers with UF's Institute of Food and Agricultural Sciences have released a parasitic fly (*Lixadmontia franki*) that kills the weevil's larvae and could help save the tree-dwelling airplants, many of which are threatened or endangered.

In the first of several releases, 56 adult flies were recently set free at Northwest Equestrian Park in Hillsborough County, where the Mexican bromeliad weevil is attacking four species of airplants unique to Florida, said Ron Cave, an associate professor of entomology at UF's Indian River Research and Education Center in Fort Pierce.

Cave discovered the beneficial insect in the mountain forests of Honduras in 1993. After 14 years of study, researchers will learn if it can survive Florida's hot, humid climate.

"I think the chances are good that it can, because insects are very adaptive," he said. "We hope that the flies will be able to find cool, shady and moist conditions in the canopy of an oak hammock, down amongst the leaves of a bromeliad holding water — little microhabitats where they'll be able to survive very well."

It's the first release of an organism reared at UF's Biological Control Research and Containment Laboratory in Fort Pierce, Cave said. The facility opened in 2004.

Teresa Cooper, a graduate student in UF's College of Agricultural and Life Sciences, built traps from wooden trays with wire-mesh bottoms that are baited with pineapple tops, each containing a weevil larva to attract the flies, said Howard Frank, a professor of entomology in Gainesville.

The traps were put out six weeks after the initial release of the flies, he said. The results have shown that the second generation of flies can find and parasitize the weevils in the Florida environment. Follow-up releases have been done at the Loxahatchee National Wildlife Refuge in Palm Beach County, Enchanted Forest in Brevard County, Big Cypress National Preserve in Collier County and Highlands Hammock State Park in Highlands County.

To breed the fly, researchers first had to raise large numbers of the weevils. But finding a food source for them was a major hurdle.

"We've tried various ways of rearing the larvae," Frank said. "We can't take bromeliads from nature to rear the weevils because they're protected. But pineapple tops are trash, they're thrown away. So we have to persuade grocery store managers to save them for us."

Pineapples are part of the bromeliad family, though not native to Florida, he said. The state is home to 16 species of bromeliads, all of which grow in trees. Larger plants are at risk because they have bigger stems that the weevil larvae mine, killing the plants.

The weevil, native to Mexico and Guatemala, was detected in Fort Lauderdale in 1989, where it is believed to have arrived in a shipment of Mexican bromeliads.

In some South Florida areas, such as Myakka River State Park, the weevil has nearly eliminated the endangered giant airplant. Researchers are most concerned about Fakahatchee Strand Preserve State Park, which contains the state's densest concentration of bromeliads, said park manager Dennis Giardina. So far, the weevil has had minimal impact at the park, home to 14 native species.

"We haven't seen the kind of wholesale die-offs that have been seen in other areas," said Giardina, who funds expeditions to Central America with Frank to seek more natural enemies to fight the weevil. "So it wouldn't be a good idea to release the flies here right now because they might not find enough weevil larvae to feed upon and perish."

If the fly is effective, researchers will need to keep breeding and releasing the insect to ensure it gets distributed throughout South Florida as quickly as possible, said Jay Thurrott, president of the Florida Council of Bromeliad Societies, which has supported the research for years. ■

– TOM NORDLIE


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Ron Cave examines a vial containing larvae of the Mexican bromeliad weevil to distinguish them from larvae of the native Florida bromeliad weevil. PHOTO BY THOMAS WRIGHT

# DEFEATING RESISTANT ROACHES

The German cockroach, one of the most common and hated household pests, is winning the war against some of the newest insecticides and baits.

"Whatever you throw at them, they have an amazing ability to quickly adapt and overcome adversity," said Phil Koehler, a professor of entomology with UF's Institute of Food and Agricultural Sciences. "We know that they have developed resistance to many of the most widely used insecticides, and now they are turning up their noses at baits, including some that were very effective just a few years ago."

He said the bait-avoidance problem was first noticed about five years ago in Florida, where the state's warm climate is ideal for roaches, and in recent months has spread to other states as far north as Michigan. "In Florida, pest control operators say that 60 percent of their customers have German cockroaches (*Blattella germanica*) that are refusing to eat most commercial baits, indicating there is something in the baits that roaches do not like," he said.

Koehler and Barbara Bayer, a graduate research assistant in UF's College of Agricultural and Life Sciences, are working with pest control operators and product manufacturers to develop and test more effective baits for the German cockroach. "It's the roach that gives all other cockroaches a bad name," Koehler said. "It's also the most common cockroach species in homes, apartments, restaurants, hotels and other institutions in the United States and in most parts of the civilized world."

As a result of their research, new bait products designed for use by pest control operators have been shown to kill cockroaches that are refusing to eat existing baits, and the UF researchers are monitoring their effectiveness. The new products are Advion roach bait manufactured by Dupont, Max Force FC Select roach bait made by Bayer Environmental Sciences and Advance roach bait from Whitmire Micro-Gen Laboratories Inc.

"It remains to be seen how long these new products will be effective," said Bayer, who is not affiliated with the bait manufacturer. "Ten years ago, German cockroaches began avoiding baits that contained glucose sugar, and now they are developing an ability to avoid other ingredients in some of the newest baits on the market. We need to learn more about which chemicals they like and do not like."

"Often measured in weeks, the roach's rapid reproductive cycle allows the pest's population to double every two weeks," Koehler said. "One female roach and her offspring can produce more than 100 million roaches in a year. Female roaches only need to mate once to lay eggs for the rest of their lives. And, if they are able to avoid baits, then you've got a real serious roach problem in no time."

Koehler, who directs UF's Urban Entomology Laboratory, said cockroaches are one of the toughest insects on the planet, and some are capable of living for a month without food or staying alive without their head for up to a week. They can also survive under water for about 45 minutes.

Besides avoiding certain chemicals in baits, roaches leave chemical trails in their feces, and other cockroaches follow these trails to discover sources of food, water and hiding places, Koehler said. "Based upon this research, we might be able to develop new techniques for controlling cockroaches," he said. "It might be possible to get rid of them by leaving a chemical trail that leads them away from the home." ■

– CHUCK WOODS

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Phil Koehler, left, and Barbara Bayer, check the effectiveness of different bait pest control products on German cockroaches in a laboratory experiment. UF/IFAS FILE PHOTO

# Biodiesel BOON

Growing plants for fuel might be an engine-revving idea for some South Florida farmers who feel their crops have stalled, according to a UF extension agent.

*Jatropha curcas*, a tree native to Mexico, is being widely grown for fuel and medicine in some parts of the world. Inside its golf-ball-sized fruit are three seeds full of oil that can be pressed to make biodiesel.

"For maybe a year and a half now, I have been working on an idea that here in South Florida we can grow a biodiesel crop that does not conflict with food and that we have a comparative advantage in growing," said Roy Beckford, a Lee County extension agent in Fort Myers who specializes in sustainable farm development.

Beckford, who works for UF's Institute of Food and Agricultural Sciences, has been pushing Jatropha as an alternate crop for South Florida farmers the past couple years through IFAS newsletters.

Biodiesel is a fuel made from natural sources, such as new and used vegetable oils and animal fats, for use in diesel engines. It is safe, biodegradable and contains fewer pollutants than gasoline.

Jatropha, also called Barbados nut or physic nut — as well as several other names, including black vomit nut for its use as a purgative — also contains glycerine that must be extracted from the fuel. Early Central American settlers lit the long-burning seeds in a bowl as makeshift candles, Beckford said.

A company called Dream Fuels recently donated some 1,500 *Jatropha curcas* seedlings worth about $6,000 to Lee County. Following the ceremonial planting of about 100 seedlings attended by Lt. Gov. Jeff Kottcamp and other officials, the rest of the seedlings were planted on a 1-acre demonstration farm at Orange River Park in the Buckingham area of Lee County.

The planting is part of a much larger effort by county officials to reduce reliance on petroleum-derived fuels. They plan to build a biodiesel plant at the site of a closed landfill and to use Jatropha and restaurant grease to fuel at least part of the county's fleet, said Lee County Commissioner Ray Judah. "We think it's doable," he said.

The trees can grow to 20 feet tall, can thrive up to 50 years and can be harvested twice a year — as quickly as 18 months after planting, under ideal conditions. It does well in both good and poor soil and doesn't require heavy cultivation, fertilization or irrigation.

One acre of Jatropha can yield between 600 to 1,000 gallons of oil per year, although at least two companies marketing the plant say they have varieties that yield much more.

Beckford said he believes farmers trying to recover from citrus canker or greening might want to give Jatropha a look. Because it fares well in bad soil, he also says the crop might be helpful for landowners whose property is unsuitable for traditional agriculture.

He also suggests that Jatropha be used as a replacement in cases where invasive plants such as Brazilian pepper and Melaleuca are removed from the landscape.

Besides the donated seedlings that are now being planted, Beckford said a handful of Lee County growers are on the verge of planting as well. Also in Lee County, a nonprofit group called Educational Concerns for Hunger Organization, or ECHO, has been growing a half-acre of the trees for more than five years.

ECHO specializes in finding alternative crops for underdeveloped countries and is currently using the trees as a "living fence." Some underdeveloped countries plant a line of trees as a fence to keep animals from grazing on their farms.

Martin Price, one of ECHO's co-founders, said although the trees appear to be doing well there, his group is hesitant to lead the cheers without more feasibility studies in place.

"We are not promoters at this point," he said. "But we're a big believer of the potential in underutilized crops."

But with other countries, such as China, India and Brazil, investing heavily in Jatropha, Beckford says time is of the essence, especially with federal goals for renewable fuels.

"I'll keep plugging it, because I want to make sure that something comes from it," he said. "If we don't do it, someone else will." ■

– MICKIE ANDERSON

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Roy Beckford displays seeds from *Jatropha curcas* trees being grown in Lee County. PHOTO BY THOMAS WRIGHT

# *User-Friendly* Updates *for* FAWN

The Florida Automated Weather Network, which provides weather data 24 hours daily to farmers and consumers via the Internet and toll-free numbers, has added new monitoring stations and redesigned its Web site for faster and more reliable service.

"Launched in October 2007, the improved site has a new user interface for streamlined navigation, new data servers and a more efficient database that will be monitored around the clock by UF staff," said Rick Lusher, director of the Florida Automated Weather Network (FAWN) operated by UF's Institute of Food and Agricultural Sciences. "We have also added new tools as well, such as an urban irrigation scheduler to aid homeowners with water usage."

In addition to the redesigned Web site, FAWN has installed new monitoring stations in Clewiston and in North Port near Venice, bringing the total number of stations around the state to 35. Each solar-powered station collects weather data and transmits it to a computer at UF in Gainesville every 15 minutes.

Lusher said the stations measure air temperature at two, six and 30 feet above the ground; soil temperature; wind speed and direction; rainfall; relative humidity; barometric pressure; leaf wetness; and solar radiation. Real-time weather data from the network is available at (352) 846-3100 or (866) 754-5732 and at the FAWN Web site: http://fawn.ifas.ufl.edu.

"Observations from our monitoring stations are more applicable to growers than those taken at conventional sites, because our stations are typically located in more rural areas," Lusher said.

He said growers use FAWN as a source of reliable information not only for cold protection, but also for disease control, irrigation scheduling, fertilizer application and other crop-management programs.

FAWN is also working closely with the AgClimate forecasting system to provide monthly climate updates and other management tools.

Jim Jones, a distinguished professor in UF's agricultural and biological engineering department, said AgClimate includes forecasts combined with risk management tools and information for selected crops, forestry, pasture and livestock. AgClimate is operated by the Southeast Climate Consortium, which includes UF, Florida State University, University of Miami, University of Georgia, Auburn University and the University of Alabama in Huntsville.

The UF Extension Service started FAWN in 1998 after the National Weather Service discontinued special forecasts for agriculture in 1996. The site is used mostly by farmers. Other users include emergency management officials, who use the data to monitor the progression of cold temperatures during winter and wind speeds during hurricanes. Forestry officials use the data to help monitor smoke plumes during forest fires or prescribed burns. ■

– CHUCK WOODS

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Rick Lusher, standing, and George Braun, field site supervisor for FAWN, install a temperature sensor at a monitoring station located at UF's Plant Science Research and Education Unit in Citra, Fla. **UF/IFAS FILE PHOTO**

# FLAT-OUT GREAT *for the* GRILL!

Sales of a new flat-iron steak — which has carved out a growing portion of the nation's $74-billion beef market over the past two years — now top 90 million pounds a year, elevating the value-priced cut to the fifth best-selling steak.

"It's flat-out great for the grill," said Dwain Johnson, a professor of meat science with UF's Institute of Food and Agricultural Sciences who helped develop the steak in 2002. "The cut is as tasty and tender as more expensive steaks, yet affordable enough for the average family to enjoy on a regular basis, and it costs a lot less than a choice filet or strip steak. Some people say it tastes better than a New York strip."

Steve Wald, director of new product development for the National Cattlemen's Beef Association in Centennial, Co., said 47 million pounds of flat-iron steak were sold in 2005, increasing to 92 million pounds in 2006 and 2007. He said the sales data was compiled by Technomic Inc., a Chicago-based research firm.

"In the food service industry, which includes restaurants, the flat-iron steak outsells T-bone and Porterhouse steaks combined, making the new cut the nation's fifth best-selling steak — after sirloin, filet, ribeye and strip steaks," Wald said. "Strong consumer demand prompted several national retailers to introduce the steak during the summer of 2007."

Johnson, who developed the steak in cooperation with the University of Nebraska and the cattlemen's association, said their research was aimed at identifying undervalued portions of the beef carcass. In the largest "muscle profiling" study of its kind, the researchers evaluated more than 5,600 muscles for flavor and tenderness.

He said the flat-iron steak — also known as the top blade steak — is cut from deep within the shoulder muscle known as the chuck, which traditionally is used for roasts or ground beef.

"Although the cut is flavorful and relatively tender, the flat iron steak has a serious flaw in the middle of it," Johnson said. "There is a tough piece of connective tissue running through the middle, but it can be removed to create an amazing cut of beef."

By developing a method for cutting the connective tissue — similar to filleting a fish — the researchers created a steak that has the tenderness of a ribeye or strip steak with the full-flavored character of a sirloin or skirt steak. It's also perfect for grilling over medium-high heat, he said.

"Supposedly named because it looks like an old-fashioned metal flat iron, the flat-iron steak is uniform in thickness and rectangular in shape," Johnson said. "The only variation is the cut into the middle where the connective tissue has been removed."

Johnson said the research to produce leaner and more convenient beef products was initiated when demand for chuck, round and "thin cuts" — which make up 73 percent of total beef carcass weight — declined by more than 20 percent from 1980 to 1998.

"The Cattlemen's Beef Board realized that a more concentrated effort was needed to study the cause for the decreased demand in products from these carcass locations," he said. "They also wanted to find out what could be done to reverse the trend and increase the demand for the chuck and round cuts."

He said other "value cuts" such as the Petite Tender and Ranch Cut are starting to be used by the food service sector. Muscle profiling has also recently been expanded to dairy cow beef and veal to find new opportunities for this segment of the beef market.

The research resulted in a publication by the cattlemen's association entitled "Muscle Profiling" that serves as an encyclopedia of information for meat packers, processors and purveyors, Johnson said. The 100-page document, available in six different languages, is available on the Bovine Myology Web site maintained by the University of Nebraska: http://bovine.unl.edu ■ – CHUCK WOODS

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Dwain Johnson selects beef cuts at the University of Florida's meats laboratory in Gainesville. He said the goal of their research was to find better, more efficient cuts from the chuck and round for both retail and food service uses. PHOTO BY THOMAS WRIGHT


# LASER LABELING



Say goodbye to those stubborn little stickers on fruits and vegetables at the supermarket.

In the next few months, consumers might see a new type of label on fresh produce — branding that is etched directly onto the skin of fruits and vegetables by a new laser-beam technology.

Greg Drouillard, a former University of Florida researcher who developed the laser marking system, said independent research throughout the United States shows that consumers like laser-imprinted identification on produce.

"Many consumers complain about the difficulty of removing stickers from fruit, especially edible-skin fruit," he said. "When they first see the laser marking on fresh produce, they want to know if it's safe to eat, and research shows that it is."

Ed Etxeberria, a professor of horticultural sciences at UF's Institute of Food and Agricultural Sciences who has been testing the technology on oranges and other fresh produce, said the laser-beam system — which is almost like tattooing fruits and vegetables with brand names, price codes and other information — eliminates the need for stickers that have to be picked or scraped off.

"Instead of going through the trouble and expense of attaching thousands of little labels to fruits and vegetables in the packinghouse, each item can be marked or branded with a quick burst of laser light, producing legible words, logos and price-look-up codes," Etxeberria said.

He said that the laser-etching technology, which does not affect the taste or quality of fruits and vegetables, cuts a few millionths of an inch — or microns — into the skin of fresh produce, creating a pinhole dot. These tiny pinhole depressions form dot-matrix alphanumerical characters that show price-look-up or PLU codes required for electronic scanners in stores. The laser can also add other readable or coded information to improve food safety, security and traceability, such as harvest date, country of origin and brand identification.

Etxeberria's studies at UF's Citrus Research and Education Center in Lake Alfred are aimed at refining the technology for citrus, lemons, tomatoes and avocados as well as apples, peaches, peppers, potatoes and other produce. Preeti Sood, a UF graduate student in the horticultural sciences department, is assisting with the research.

"We are refining the laser technology to reduce any potential problems such as water loss, decay or damage during shipping and storage," Etxeberria said. "Tests in our lab, packing house and at the retail level show that the laser technology can be used on fruits and vegetables without any problems. The laser system offers producers many advantages over the use of old-fashioned adhesive tags that can foul processing equipment or come off produce at any stage of the post-harvest process."

Drouillard, who is now director of laser technology for Sunkist Growers Inc. in Fontana, Calif., said the laser marking system could eventually replace many of the 20,000 labeling machines now being used in the United States. Sunkist is providing equipment for Etxeberria's research at UF's Lake Alfred center.

The vacuum motor used on current labeling machines uses enough power to run 12 lasers, and each laser unit can apply marking to fresh produce at the rate of 17 pieces per second or 1,200 per minute — about double the fastest sticker machines. He said the switch to lasers will reduce labeling costs by more than half while also improving food safety and speeding up scanning at the check-out counter.

"The Food and Drug Administration is reviewing Sunkist's petition for approval of the laser labeling process, following more than two years of testing to certify the technology is safe and effective," Drouillard said. "We hope to have their approval in the near future."

■ — CHUCK WOODS

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Ed Etxeberria, left, and Greg Drouillard adjust laser-labeling equipment at UF's Citrus Research and Education Center in Lake Alfred. **PHOTO BY MICHELLE WEGER**

# CA$HING *in on* CAVIAR

Mention sturgeon to a Floridian these days, and they might flinch. The armor-plated fish have made news recently by body-checking boaters, but the animals might soon develop a new reputation — as cash cows.

Sturgeon farmers across the Sunshine State say marketable yields of caviar could begin within the next year. It's an effort almost 20 years in the making, but could be a multimillion dollar boon in just a few more, according to the man who instigated much of the work, Frank Chapman, an associate professor of fisheries and aquatic sciences at UF's Institute of Food and Agricultural Sciences.

"This year and next will show you the proof that this will be a big thing here," Chapman said. "Soon, it's going to be a big thing everywhere."

Historically, caviar has been harvested from sturgeon found in the wild. However, overfishing for the pricy delicacy drove populations to dangerously low levels worldwide early in the last century. While some populations have rebounded, harvesting wild caviar is still outlawed or severely restricted in many areas of the United States.

"So now, we say 'why don't we just raise them on farms?' And that's what we have done," Chapman said.

The idea has its roots in California, where Serge Doroshov, a professor at the University of California, Davis, and a few of his students, including Chapman, began raising white sturgeon in the 1980s. Since then, the idea has spawned a profitable business, but one that's limited because California law restricts species raised for commercial use to those native to that state.

"We can grow many varieties here in Florida, especially those that people want to eat," said Ricardo Armelin, the operator of Rokaviar Sturgeon Farm near Homestead. His facility is setting up methods to process and package its first yield of highly desirable Siberian sturgeon caviar by the end of this year.

Rokaviar, like several other farms, began much of its stock with fish supplied by Chapman. Collaborating with these farms, Chapman also developed husbandry techniques that help the fish mature in as little as six years — nearly four to 10 years faster than their wild counterparts.

Jim Michaels, manager for Sarasota's Mote Marine Laboratory's Sturgeon Aquaculture Project, said his test facility has already produced two small batches of caviar. "Our hope is — and we're well on our way — is to work over the next several years to hit 2.5 tons a year," he said.

The nature of caviar production makes upcoming yields difficult to predict. However, Chapman estimates that caviar, if well accepted by investors, could become a $100 million statewide industry in the next 10 to 20 years, which would likely make it Florida's largest aquaculture commodity.

However, the Sunshine State won't be the only major caviar producer in the United States — at least not for long. Chapman is helping develop programs at the University of Hawaii and the University of Georgia. The growing popularity, he said, is a sign that people are starting to get the right idea about a misunderstood fish.

Gulf sturgeon swam into the spotlight this summer after several incidents where the leaping fish — which can grow to 8 feet and have hard plates along their backs — collided with and injured boaters.

"People hear all about these crazy fish, and they say, 'why would you want to raise those things?'" Chapman said. "And I tell them, they are beautiful animals that give us beautiful food. Besides, they're very nice and docile. When they swim up, I can touch them." ■ – STU HUTSON

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Frank Chapman holds a shortnose sturgeon at UF's fisheries and aquatic sciences department in Gainesville. He said the fish, which is native to Florida and currently an endangered species, has ideal characteristics for culture and produces a high number of eggs — up to 30 percent of its body weight. The caviar is large, similar to preferred sturgeon species such as Beluga, Osetra and Sevruga. PHOTO BY THOMAS WRIGHT

# SAVING WATER *with* Soil-Moisture Sensors

Soil-moisture sensors hooked to sprinkler systems could put a huge dent in homeowners' utility bills — and help conserve much-needed water, a new University of Florida study says.

Researcher Michael Dukes found that for three of four rain sensors tested, water savings ranged from 69 percent to 92 percent, compared to grass watered without the help of sensors.

"The savings turnaround could be pretty rapid," said Dukes, an associate professor in the agricultural and biological engineering department, part of UF's Institute of Food and Agricultural Sciences.

That's partly because in recent years, soil-moisture sensors have become less expensive, smaller and more accurate, he said.

"The cost is changing rapidly. A few years back, a $400 list price and about $100 to install was common, but now we're seeing products in the $100 to $200 range," he said. A typical Florida yard would require one sensor, though larger landscapes would likely need more. To get the biggest savings, the irrigation system and the sensors must be in good repair, well designed and properly installed, Dukes said.

The sensor, buried ideally in the driest part of the lawn, overrides the automatic irrigation system if the lawn doesn't need water.

In the study, accepted for publication in the *Journal of Irrigation and Drainage Engineering*, UF researchers tested four types of rain sensors. The more recent study dovetails with an earlier one by the same researchers — published in the journal's September-October issue — that showed homeowners could reduce water consumption by a third simply by setting their lawn-watering systems to more closely match plant needs, according to the season.

In the most recent study, each sensor was tested at irrigation frequencies of one, two or seven days a week. The one- and two-day watering frequencies most closely resemble typical watering restrictions in Florida. Data was collected from July 20 to Dec. 14 of 2004 and March 25 to Aug. 31 in 2005.

On average, studies have shown that U.S. homeowners use about 50 percent more water outdoors than indoors. And water officials say lawn irrigation accounts for nearly half the potable water used in South Florida.

Taking the human component out of the watering process certainly seems to help reduce overwatering, said Kathy Scott, section manager for conservation projects with the Southwest Florida Water Management District, which sets water policy for some 4.5 million residents.

But Scott said her agency remains cautious and not quite ready to urge homeowners to run out and buy a soil-moisture sensor just yet. That may happen, though, after more study of homeowners' watering habits.

"We are going to end up with a whole list of best management practices, so that we'll be able to tell people exactly how to use the sensors," she said. "We know they save water, we know that. But what we don't know is what happens when the dial is in the homeowner's hands."

Many residents don't realize how little irrigation most lawns need, she said. Often, those trying to start a new lawn take advantage of less-restrictive watering rules — unwittingly giving their new lawn a poor start.

"If you water too much, the roots don't have any incentive to grow deep, so you end up with a lawn that's weak, susceptible to pests, disease and has shallow roots," Scott said.

It just seems to be human nature to overdo it, she said.

"My sense, from talking to people about this, is that they think if a little water's good, a lot is better." ■

– MICKIE ANDERSON

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Michael Dukes holds a soil moisture sensor and data logger used for motnitoring soil water content in turfgrass research plots at the University of Florida. UF/IFAS FILE PHOTO

SPOTLIGHT

# Jefferson Science Fellow

Janaki Alavalapati, left, who is on a 12-month fellowship at the U.S. Department of State in Washington, D.C., met with Secretary of State Condoleezza Rice on Oct. 4, 2007. **U.S. DEPARTMENT OF STATE PHOTO**

Janaki Alavalapati, a professor in UF's School of Forest Resources and Conservation, is serving as a 2007 Jefferson Science Fellow at the U.S. Department of State in Washington, D.C. He began the 12-month fellowship in August 2007, and he is serving as a senior adviser for international energy affairs.

He is one of eight scientists and engineers nationwide selected for the position, and the first faculty member from any Florida institution to be named a Jefferson Science Fellow. Alavalapati specializes in researching market solutions to natural resources, environmental and energy conservation problems.

As a fellow, he will work with senior diplomats and policy makers providing scientific advice on complex U.S. foreign policy and international relations. He will return to UF in August 2008, but remain available to the government as an expert consultant for short-term projects for an additional five years.

Individuals are selected for the program through a competition administered by the National Academy of Sciences and the Office of the Science and Technology Adviser to the Secretary of State. Fellows are selected on the basis of scientific achievements, communication skills and interest in science and engineering policy. ■ **– TOM NORDLIE**

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# Family Album Radio Award

Suzanna Smith, left, and Donna Davis prepare to record Family Album Radio in the studios of WUFT-FM in Gainesville. **UF/IFAS FILE PHOTO**

"Family Album Radio," a daily, two-minute radio program produced by UF's Institute of Food and Agricultural Sciences in cooperation with UF's College of Journalism and Communications, received the 2007 Media Award from the Council on Contemporary Families (CCF) at its 10th anniversary conference in Chicago.

The award for coverage of American families was presented April 18, 2007 to Suzanna Smith, an associate professor, and Donna Davis, senior producer and host of Family Album Radio. Both are part of UF's family, youth and community sciences department. Smith also serves as executive producer of the program for the UF Extension Service.

Davis said Family Album Radio presents "snapshots of our changing families" based on current academic peer-reviewed family social science research. She said judges liked the excellent choice of topics and the program's fit with the goals of CCF.

The program is distributed nationally via National Public Radio, commercial radio stations and the Internet at www.familyalbumradio.org. In North Central Florida, the program is aired on WUFT-FM in Gainesville and WJUF-FM in Inverness.

The CCF media awards were established in 2002 as part of the council's commitment to enhancing the public understanding of trends in American family life. "All too often, changes in U.S. family patterns are painted in stark, better-or-worse terms that ignore the nuanced and complex realities of family life today," Smith said.

Smith said the awards committee looked for radio programs that put individual family issues in larger social context. This kind of coverage offers the public a balanced picture of the trade-offs, strengths and weaknesses in many different family arrangements and structures, she said.

Family Album Radio was one of five award winners recognized by CCF. The outstanding print coverage award was presented to *Time* magazine, and a PBS production by Thirteen/WNET in New York was recognized for oustanding video coverage. ■ **– CHUCK WOODS**

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# UF Awards for Agricultural Leaders

ALLEN BOYD

KATHLEEN EUBANKS

CHIP HINTON

RICK MINTON

JAMES STICE

Four alumni from UF's College of Agricultural and Life Sciences (CALS) and a UF honorary alumnus recently received awards for outstanding contributions to the college and university as well as the state's agriculture, natural resource and life science industries, and related professions.

During UF's Sept. 15, 2007 "Tailgator" celebration, Kathleen Eubanks and Rick Minton Jr. each received the CALS Alumni and Friends Award of Distinction, and James Stice received the CALS Alumni and Friends Horizon Award. The Horizon Award is presented to CALS alumni who have completed their most recent UF degree during the past 10 years. The awards were given to Eubanks, Minton and Stice by Kirby Barrick, dean of the college.

At Tailgator, the UF Alumni Association presented its Honorary Alumnus Award to U.S. Rep. Allen Boyd for his significant contributions to the university. Boyd, who attended UF from 1963 to 1965, served in the Florida House of Representatives from 1989 to 1996. Jimmy Cheek, UF senior vice president for agriculture and natural resources, presented the award to Boyd.

During the Aug. 11 summer commencement program, the UF Alumni Association also recognized Charles "Chip" Hinton with its Distinguished Alumnus Award — one of the association's most prestigious accolades. Barrick presented the award to Hinton.

Eubanks received her bachelor's and master's degrees in animal science in 1974 and 1976, respectively. Her lifelong career includes managing her family's 2,400 acre cow-calf operation in Micanopy, Fla.

Born and raised in Fort Pierce, Fla., Minton received his bachelor's degree in horticultural sciences and master's degree in agricultural management and resource development in 1972 and 1973, respectively. In 1992, he was elected to the Florida House of Representatives where he served District 78 for eight years. Minton continues his involvement with many agriculture-related and community organizations. His contributions to UF include serving as a member of the IFAS Development Program and as chairman of the advisory board for UF's Indian River Research and Education Center in Fort Pierce.

A native of Marianna, Fla., Stice received dual bachelor's degrees in animal science and agricultural operations management in 1997. He is currently employed with U.S. Sugar Corporation and is a member of the Florida Cattlemen's Association and National Cattlemen's Beef Association. In 2005, Stice was recognized by UF Block and Bridle as an Honorary Alumni Member.

Hinton, who received his bachelor's, master's and doctoral degrees from CALS, served as executive director of the Florida Strawberry Growers Association from 1982 to 2006.

He is a past president of the Florida Agricultural Council, an industry group that assists UF in the Florida Legislature. Hinton also serves on many other organizations, including the board of the Florida Fruit and Vegetable Association, the Florida Agricultural Hall of Fame, the Florida Ag Institute, the Southwest Florida Water Management District and the Florida 4-H State Leadership Advisory Committee. ■

– CHUCK WOODS

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# J. Paul Getty Award

ULLAS KARANTH

A former graduate student in UF's wildlife ecology and conservation department has been awarded the 2007 J. Paul Getty Award for Conservation Leadership.

Ullas Karanth, who earned his master's degree in 1988 from UF's College of Agricultural and Life Sciences, now works in India, where he earned his doctoral degree in applied zoology at Mangalore University in 1993.

He has worked toward the conservation of Asian elephants and tigers, helped create three protected land areas in the Western Ghats and done innovative work on voluntary resettlement to benefit both people and wildlife. He is currently director of the Wildlife Conservation Society in India and oversees a postgraduate program in wildlife biology and conservation at the National Centre for Biological Sciences in Bangalore.

The J. Paul Getty Award for Conservation Leadership is given to a single recipient each year and establishes a $200,000 fellowship in the recipient's name to support conservation-related education and training. He received the award Oct. 16 at a ceremony in Washington, D.C. ■

– CHUCK WOODS

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# New Department Chair

NEIL SHAY

Neil Shay, a leading nutritional scientist with Kellogg Company and UF alumnus, began serving as the new chairman of the university's food science and human nutrition department on Nov. 3, 2007.

In announcing the appointment, Jimmy Cheek, UF senior vice president for agriculture and natural resources, said Shay is an exceptional scientist and scholar with an outstanding record of achievements.

"Dr. Shay's expertise lies in understanding how the availability of nutrients affects gene expression and metabolism," Cheek said. "We are fortunate to have successfully recruited him to UF's Institute of Food and Agricultural Sciences, and we look forward to his leadership and continuing accomplishments."

Shay said he is pleased to return to UF, where he earned his doctorate in biochemistry and molecular biology in 1990 and did postdoctoral research work from 1990-92 with the Center for Nutritional Sciences and the food science and human nutrition department.

As chair, his goals for the department include modernizing research and teaching laboratories, making new hires to replace retiring longtime faculty, finding ways to better serve the increasing numbers of students pursuing the undergraduate nutrition major, and expanding linkages to the health sciences and engineering.

Shay worked for Kellogg from 2005 until he joined the UF faculty. At Kellogg, he became the company's lead scientist responsible for evaluating bioactivity and efficacy of novel functional food ingredients.

From 2000 to 2005 he was an associate professor of biological sciences with the University of Notre Dame, and from 1993 to 1999 he was a faculty member with the University of Illinois at Urbana-Champaign, where he held several positions.

At UF, he was a National Institutes of Health-National Research Service Award postdoctoral research fellow in 1991-92 and a postdoctoral research associate in 1990-91. Shay was a graduate research assistant in the UF College of Medicine's biochemistry and molecular biology department from 1985 until he earned his doctorate in 1990.

Shay received a master's degree in physics and education from the University of Massachusetts Amherst in 1979 and a bachelor of science degree in zoology from Amherst in 1976. ■

– TOM NORDLIE

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# Entomological Society Fellow

NAN-YAO SU

The Entomological Society of America has selected Nan-Yao Su, a professor of entomology at UF's Fort Lauderdale Research and Education Center, as an ESA Fellow for his outstanding research, teaching and extension contributions. He was recognized Dec. 9, 2007 in San Diego, Calif., at the society's annual meeting.

Su is an international authority on termites, including the highly destructive Formosan termite. His research led to the development of the Sentricon Termite Colony Elimination System marketed by Dow AgroSciences LLC in 18 countries. The product has reduced pesticide use by more than 6,000 metric tons.

"Conventional pesticide treatments may keep termites out of buildings, but they don't control termite colonies in the ground," Su said. "Unlike traditional barrier control methods, our new system eliminates underground colonies of both subterranean and Formosan termites — a first for the pest control industry."

Su's expertise prompted the National Park Service to seek his help in stopping termite infestations at historic landmarks such as the Statue of Liberty, the Cabildo and Presbytere in New Orleans' French Quarter, San Cristobol in San Juan, Puerto Rico, and the Christiansted National Historic Site in St. Croix, U.S. Virgin Islands.

He joined the faculty of UF's Institute of Food and Agricultural Sciences in 1984. Su completed his bachelor's and master's degrees in sericultural science at Kyoto Institute of Technology in Japan, and received his doctoral degree in entomology from the University of Hawaii. ■

– CHUCK WOODS

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# Distinguished Mentor Award

KEVIN FOLTA

Kevin Folta, an assistant professor in the horticultural sciences department, is the first faculty member in UF's Institute of Food and Agricultural Sciences to receive the Howard Hughes Distinguished Mentor Award. The award was presented to him in March 2007.

Now in its second year, the program recognizes researchers who extend their research to undergraduate students. During the past four years, Folta has hosted research appointments for 17 undergraduate students, and five of them have contributed to peer-reviewed scientific journals. Overall, the undergraduate research findings have been presented in more than 20 abstracts and poster sessions at national and international conferences.

The award is funded by the Howard Hughes Medical Institute as part of the UF's Science for Life program. Each winner receives approximately $10,000 in funding to help develop and promote undergraduate research. Folta's award has been earmarked for summer undergraduate internships to foster interest in graduate opportunities in plant science, such as those in UF's plant molecular and cellular biology graduate program.

Folta, who joined the UF faculty in 2002, has a dual research focus. He studies how various quantities, colors and durations of light treatment can affect important plant traits, such as stature, yield, or the timing of flowering. He also directs an internationally recognized strawberry genomics program and is the editor for the forthcoming book, *Genetics and Genomics of the Rosaceae*.

He received his bachelor's degree in biological sciences from Northern Illinois University in 1989 and his doctoral degree in molecular biology from University of Illinois in 1998.

The Howard Hughes Medical Institute, headquartered in Chevy Chase, Md., is a nonprofit medical research organization and one of the nation's largest philanthropies that helps advance biomedical research and science education in the United States. ■

– STU HUTSON

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# Friends of Agricultural Economics

ADAM PUTNAM

U.S. Rep. Adam Putnam was recognized Sept. 18 as one of two 2007 Friends of Agricultural Economics for his appreciation of economics as applied to policy issues involving agriculture, natural resources, food and nutrition.

The Council on Food, Agricultural and Resource Economics (C-FARE) also honored Connecticut Rep. Rosa DeLauro.

The awards were announced at a reception in Washington, D.C. Tom Spreen, chairman of UF's food and resource economics department, and vice president of the National Association of Agricultural Economics Administrators (NAAEA), nominated Putnam for the honor. The reception was held in connection with the NAAEA's biannual meeting on economics policies and funding issues important to researchers and agricultural producers.

Elected to Congress on November 7, 2000, Putnam is a native of Bartow, Fla., and received a bachelor's degree in food and resource economics from UF's College of Agricultural and Life Sciences in 1996. He currently serves on the Capital Markets, Insurance and Government Sponsored Enterprises subcommittee of the U.S. House Financial Services Committee. Before being elected to Congress, he worked in his family's citrus and cattle business. He also served four years in the Florida House of Representatives.

C-FARE is a nonprofit organization dedicated to strengthening the national presence of the agricultural economics profession. ■

– MICKIE ANDERSON

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# Florida Agricultural Hall of Fame

ALTO STRAUGHN

Alto Straughn, a former assistant director of UF's statewide extension service, was inducted into the Florida Agricultural Hall of Fame in February 2008 in recognition of his many contributions to Florida agriculture.

Straughn's career in agricultural research, education and commercial farming spans more than 50 years, and his leadership in blueberry and watermelon farming continues to strengthen agriculture in the Sunshine State.

Born in Walton County in 1934, Straughn attended UF's College of Agricultural and Life Sciences, where he earned bachelor's degrees in animal science and vocational agriculture with high honors. In 1957, he completed a master's degree in animal science at UF, also with high honors.

Upon graduation, Straughn began raising cattle and growing watermelons. In 1959, he also began working as a UF extension agent in Marion County. Three years later, with the aid of a Kellogg Foundation grant, he went to the University of Wisconsin where he completed his doctorate in extension administration in 1963.

Straughn then became an assistant professor and extension program specialist with UF's Institute of Food and Agricultural Sciences. In 1969, he became assistant director of the extension service, and he was named director of program evaluation and organizational development in 1971. Throughout his career, Straughn also has been actively involved in the 4-H youth development program.

After his retirement in 1989 from UF as professor emeritus in the agricultural education and communication department, Straughn continued to expand his cattle, blueberry, timber and watermelon farming operations to more than 2,000 acres in three locations near Gainesville.

Straughn's innovation and leadership in blueberry production has been crucial to the success of the $40 million industry in Florida. He now produces about one-third of all blueberries in Florida, and works closely with UF researchers to conduct blueberry variety trials and demonstrate new production technologies at his farms.

He also has been an innovator for the Florida watermelon industry — one of the early adopters of new watermelon production technologies on his farms, including polyethylene mulch and drip irrigation. ■ – CHUCK WOODS

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# Remembering a Leader

KENNETH TEFERTILLER

Kenneth Ray Tefertiller, head of UF's Institute of Food and Agricultural Sciences from 1973 to 1988, died Nov. 13, 2007 at the age of 77.

He joined the UF faculty in 1965 when he became chairman of the food and resource economics department. He retired in 2000 as professor emeritus.

Tefertiller will be remembered for his successes in keeping Florida agriculture competitive nationally and internationally, yet compatible with the state's environment. He took leadership of IFAS as Florida agriculture began confronting challenges from urban growth, environmental concerns and dramatically rising fuel costs. He also initiated new programs in biotechnology, energy efficiency, integrated pest management and water conservation.

Born in Noble, Okla., Tefertiller earned a bachelor's degree in agricultural sciences from Oklahoma State University in 1952. He served in the U.S. Army from 1952-54, where he attained the rank of major.

In 1955 he began his teaching career, working as an instructor at Oklahoma State and earning a master's degree in agricultural economics there in 1957. He earned a doctorate in agricultural economics from the University of Illinois in 1959. Then he joined Texas A&M University, where he became an associate professor and chairman of the production economics section of the agricultural economics and sociology department.

During his academic career, Tefertiller held numerous leadership positions, including posts as president of the Southern Agricultural Economics Association in 1971-72 and president of the American Agricultural Economics Association in 1974. In 1995 he served as a delegate to the White House Conference on Small Business.

His many honors included a Man of the Year award from *Progressive Farmer* magazine, the Distinguished Alumni Award from Oklahoma State University, the Distinguished Service Award from the Florida Fruit and Vegetable Association and a White Hat Award from the Agribusiness Institute of Florida.

He also received an Honorary Lifetime Achievement Award from the Southern Agricultural Economics Association in 1998, the E.T. York Distinguished Service Award from UF/IFAS in 2000 and was inducted into the Florida Agricultural Hall of Fame in 2003.

Through the University of Florida Foundation, Tefertiller and his wife established the Kenneth R. and Waynell Tefertiller Endowment, providing financial assistance to students in UF's College of Agricultural and Life Sciences. ■

– TOM NORDLIE

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# AAAS Fellow

PETER HANSEN

Peter Hansen, a professor of animal science in UF's Institute of Food and Agricultural Sciences, has been named a 2007 Fellow in the American Association for the Advancement of Science. He was recognized for his contributions in reproductive biology in February 2008 in Boston at the association's annual meeting.

His research focuses on the effects of elevated temperature on early embryonic development, embryo transfer as a reproductive management strategy to overcome infertility in dairy cows, and interactions between the immune system, the reproductive tract and the embryo. He also teaches graduate courses in reproductive physiology and environmental physiology.

Hansen has published more than 190 refereed papers and received many awards, including the Herr Award from the American Society for Reproductive Immunology and the Physiology and Endocrinology Award from the American Society for Animal Science. He is a past-president of the American Society for Reproductive Immunology and has served on the editorial boards of several publications, including the *Journal of Dairy Science* and *Biology of Reproduction*.

He joined the faculty in UF's animal sciences department in 1984. Hansen received his bachelor's degree in agricultural sciences from the University of Illinois. He also completed his master's and doctoral degrees in endocrinology-reproductive physiology at the University of Wisconsin. ■

– CHUCK WOODS

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# IFAS DEVELOPMENT *News*

Tom and Mary Braddock. **PHOTO COURTESY OF THE BRADDOCKS**

Jimmy Cheek, left, UF senior vice president for agriculture and natural resources, accepts a $100,000 check from Richard Barber of the Marion County Farm Bureau. Also present for the ceremony were Todd Dailey, Marion County Farm Bureau scholarship chairman, and Ken DeVries, assistant vice president for IFAS development. **PHOTO BY TYLER JONES**

Alto and Patrecia Straughn. **PHOTO COURTESY OF OLAN MILLS**

## Thomas H. and Mary J. Braddock

Thomas H. and Mary J. Braddock included a charitable bequest in their estate plans currently valued at $1.7 million designated for UF's Institute of Food and Agricultural Sciences. Their bequest will one day establish "The Thomas H. and Mary J. Braddock Eminent Scholar Chair for the Department of Animal Sciences." Their future gift will also create two additional endowment funds entitled "The Thomas H. and Mary J. Braddock 4-H Leadership Program Fund" as well as "The Thomas H. and Mary J. Braddock Duval County 4-H Fund."

Tom retired from IFAS extension in Duval County after more than 39 years of service as county extension director and remains actively engaged in raising timber and beef cattle. He and his spouse, Mary, reside in Fernandina Beach, Fla.

## Marion County Farm Bureau Establishes Endowment

The Marion County Farm Bureau established a $100,000 scholarship endowment to benefit undergraduate students in the College of Agricultural and Life Sciences who hail from Marion County and pursue agricultural careers. The endowment is eligible for up to $50,000 in state matching funds.

## Joye Giglia Endowment Fund

The Lake Region Chapter of the Florida Nurserymen, Landscape and Growers Association pledged $100,000 to benefit "The Joye Giglia Endowment Fund." Frank Giglia, Lake Region Chapter's president, spearheaded the endowment, which was established in memory of his wife, Joye. The fund will support innovative agricultural research at UF/IFAS.

## The W. Bernard and Elaine P. Lester Student Development Endowment

W. Bernard and Elaine P. Lester pledged $100,000 to establish "The W. Bernard and Elaine P. Lester Student Development Endowment." Income generated from their endowment gift will support College of Agricultural and Life Sciences student participation in the National Agri-Marketing Association, Quiz Bowl, and other competitive and personal skill enhancement activities.

## The Alto and Patrecia Straughn Extension Professional Development Center

Alto Straughn and his wife, Patrecia, have given $600,000 toward the construction of the new "Alto and Patrecia Straughn Extension Professional Development Center," which will serve as a home for all professional development activities of IFAS extension professionals throughout the state of Florida. Straughn was a driving force behind professional development efforts for county faculty in Florida. He dedicated much of his professional career to assisting county and state extension faculty members with improving their effectiveness as educators. He and Patrecia stay busy with their beef cattle, blueberry, watermelon and timber farming operations, which cover more than 2,000 acres around Gainesville. The Straughn's gift is eligible for a 100 percent state match from the Alec P. Courtelis Facilities Enhancement Challenge Grant Program.

# IFAS *Development*

*"Private Gifts Providing the Margin of Excellence"*

## WHAT IS IFAS DEVELOPMENT?

The IFAS Development program serves as the central fundraising effort to secure private support for the University of Florida's Institute of Food and Agricultural Sciences in partnership with the SHARE Council direct support organization and the University of Florida Foundation Inc. Charitable gifts provide the "margin of excellence" for IFAS academic programs, research, extension and facilities.

## WAYS TO GIVE

There are several ways to support IFAS:

- Cash
- Charitable Bequests *(wills and trusts)*
- Real Estate *(residential or farmland)*
- Life Income Gifts *(charitable remainder trusts, annuities, retained life estates and retirement planning)*
- Stocks *(especially appreciated stocks)*
- Life Insurance *(new or existing policy)*

## UF/IFAS ENDOWMENTS

Endowments are named, permanent funds that provide annual renewable support for donor-designated IFAS programs. Endowments are managed and invested by the University of Florida Foundation. As of December 31, 2007, there are more than 250 UF/IFAS endowments valued at more than $93 million established by individual College of Agricultural and Life Sciences alumni, businesses, associations and friends of UF/IFAS.

## MATCHING GIFT PROGRAMS

The state of Florida currently provides generous matching funds for endowed gifts of $100,000 or more through its Major Gifts Trust Fund, according to the following state matching gift levels:

| GIFT | MATCH |
|---|---|
| $100,000 to $599,999 | 50% |
| $600,000 to $1,000,000 | 70% |
| $1,000,001 to $1,500,000 | 75% |
| $1,500,001 to $2,000,000 | 80% |
| $2,000,001 or more | 100% |

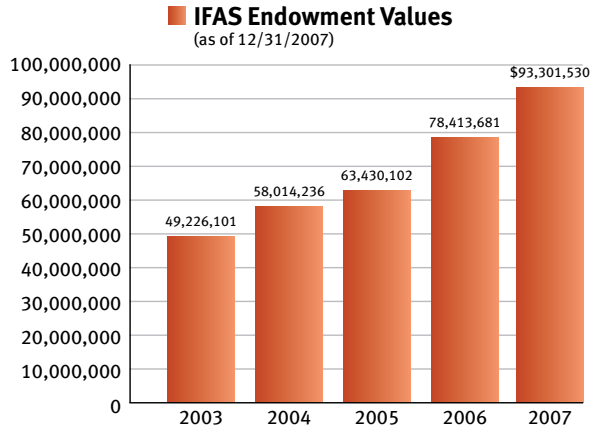
The Alec P. Courtelis Facilities Enhancement Challenge Grant Program provides 100 percent matches for gifts to construct or renovate UF/IFAS academic buildings.

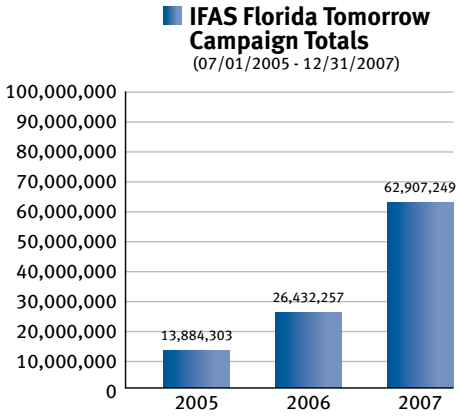
## FLORIDA TOMORROW CAMPAIGN

In July 2005, the University of Florida initiated its third and largest ever comprehensive campaign with a goal to raise $1.5 billion in private gifts. To enhance support for its teaching, research and extension programs and facilities, IFAS has set its unit campaign goal at $100 million.

## UF/IFAS CAMPAIGN GOALS

| | |
|---|---|
| Faculty Support | $42,500,000 |
| Graduate Support | $9,000,000 |
| Undergraduate Student Support | $8,000,000 |
| Program Support and Research | $29,500,000 |
| Campus Enhancement | $11,000,000 |
| Total | $100,000,000 |

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  Calendar, Getting Started, Maintenance & Care, Plants & Grasses, Problems, Types of Gardens, Industry Professionals, A - Z Index
- **Sustainable Living**
  Agriculture, Environment, Lawn & Garden, Consumers, Involved Citizens, Government Issues, Building & Construction, Land Use & Development
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### Upcoming Events

- Featured Events
- Extension Events Calendar
- Continuing Education / Training & CEUs

### IFAS Resources

- EDIS: IFAS Publications
- Extension Bookstore
- IFAS News
- FAWN: Florida Automated Weather Network
- The Disaster Handbook

### Main IFAS Units

- Institute of Food and Agricultural Sciences (IFAS)
- IFAS Research
- College of Agricultural and Life Sciences (CALS)

### RSS Feeds

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UF UNIVERSITY of FLORIDA

# Solutions for Your Life

LARRY ARRINGTON

Round-the-clock access to useful, research-based information from the University of Florida is now just a few clicks away!

Launched by the UF Extension Service in May 2006, the www.SolutionsForYourLife.com Web site offers a wide range of information from UF's Institute of Food and Agricultural Sciences, as well as partnering agencies and institutions.

"Solutions For Your Life isn't meant to replace direct contact with our extension offices in all 67 Florida counties, but it supplements what our offices can do," said Larry Arrington, dean for extension. "Because the Web site is available 24/7, it lets users browse or research information on their own schedule. And it links our clientele with all three branches of IFAS — the Florida Cooperative Extension Service, Florida Agricultural Experiment Station and the College of Agricultural and Life Sciences."

With thousands of how-to publications, educational programs, technical reports and other materials, Solutions for Your Life helps UF extension faculty serve their clients more effectively. The Web site, which receives about 1,000 visits daily, is one of the largest and most sophisticated extension Web sites in the nation, Arrington said.

The home page contains six permanent topics — agriculture, community development, environment, families and consumers, 4-H youth development, and lawn and garden. Each topic has its own Web page to help users find specific information.

In the popular lawn and garden category, for example, two new online gardening tools were added recently to the Solutions For Your Life site — a Florida gardening calendar and a guide to IFAS demonstration gardens around the state.

The online calendar provides gardeners across the state with a monthly guide of what to plant and do in their gardens, all based on IFAS research and expertise. It was developed in response to common gardening-related questions that county extension agents receive. The calendar is available in three editions — North Florida, Central Florida and South Florida — and provides visitors with links to useful IFAS Web sites and related publications.

"A lot of people don't know what to do when," said Sydney Park-Brown, an extension associate professor of environmental horticulture at the Plant City campus of UF's Gulf Coast Research and Education Center. "Each calendar is different and is customized for that particular area. Plus it also links them to more information on the topic or task."

The other new online gardening tool is a guide to the IFAS-affiliated demonstration gardens throughout the state. Floridians can visit these gardens to relax, to learn more about gardening and even to get their hands dirty during hands-on demonstrations.

"I think anybody that's interested in plants loves to go to gardens," Brown said. "And the great thing about the demonstration gardens is that everything is usually labeled and they offer practical, Florida-friendly landscape tips."

Best of all, most of the IFAS extension gardens are open year-round and are free to the public. "It's nice to know you've got these resources in your backyard," Brown said. ■


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Ecology and Management


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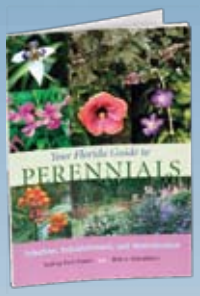
Selection, Establishment, and Maintenance

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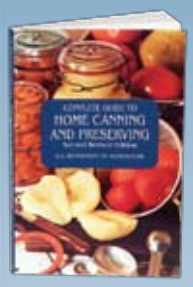


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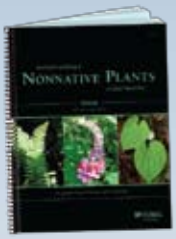


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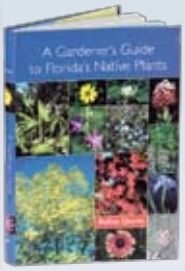


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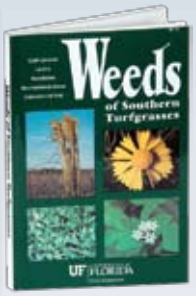


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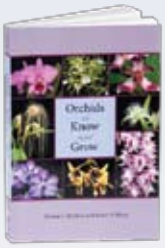


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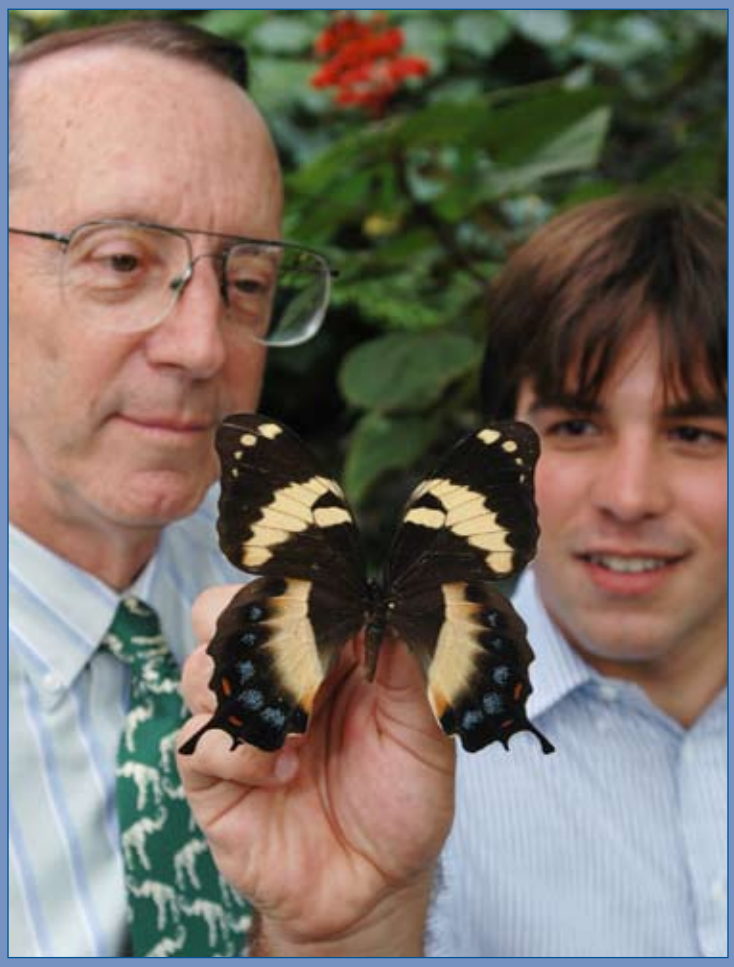

UF/IFAS FILE PHOTO

# BIG Butterfly

Tom Emmel, left, an affiliate professor of entomology with UF's Institute of Food and Agricultural Sciences, and Matt Lehnert, an entomology graduate student in UF's College of Agricultural and Life Sciences, look at a preserved specimen of the Homerus swallowtail butterfly (*Papilio homerus*) at UF's McGuire Center for Lepidoptera and Biodiversity in Gainesville.

With a six-inch wingspan, the Homerus is the largest butterfly in the Western hemisphere, but it is endangered and found only in two parts of Jamaica. Lehnert recently published a study in *The Journal of Insect Conservation* estimating the size of the population in western Jamaica to be about 50 adults, requiring conservation and captive breeding to save the insect. The good news is that the population was larger than expected, said Emmel, who is Lehnert's graduate advisor. He said only a few butterflies in the world are bigger. The largest is Papua New Guinea's Queen Alexandra's birdwing, which has a 12-inch wingspan.

Emmel previousely helped rescue the endangered Schaus swallowtail and Miami blue butterflies native to Florida. ■

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