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IMPACT

The University of Florida Institute of Food and Agricultural Sciences



South Florida Focus
putting FLORIDA FIRST



**UNIVERSITY OF
FLORIDA**

Institute of Food and Agricultural Sciences

Perspective

By Mike Martin



Mike Martin, Vice President for Agriculture and Natural Resources

As the state's land-grant university, the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) is well positioned to play a major role in helping Florida and its people maintain a vibrant economy, sustain our natural environment and enjoy the benefits of an improved quality of life.

Indeed, through research, education and extension, UF/IFAS will be central in ensuring that Florida's food system remains globally competitive, environmentally friendly and responsive to the needs of the people.

Because UF/IFAS has faculty and facilities located in every county in Florida, we can help focus the expertise and problem-solving ability of the University of Florida on local issues such as environmental protection, water quality and allocation, land use, waste recycling, food safety, improved nutrition and community development.

In this issue of IMPACT, we are pleased to highlight how UF/IFAS is putting Florida FIRST in the South Florida area in many ways, including the following: best management practices for the Everglades Agricultural Area, UF degrees for place-bound students, affordable housing projects in Collier County, nutrition education for Hispanics in Hialeah, environmental enhancement for Florida Bay and solving urban problems in Fort Lauderdale.

UF/IFAS will continue to build and enhance programs which will serve the people of South Florida for years to come. We invite our stakeholders to participate in shaping the ways we can be most effective in this dynamic part of Florida.

A handwritten signature in blue ink that reads "Mike Martin".

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UF/IFAS is putting Florida FIRST in developing knowledge in agricultural, human and natural resources and the life sciences and making that knowledge accessible to sustain and enhance the quality of human life. Visit the Florida FIRST (Focusing IFAS Resources on Solutions for Tomorrow) Web page at: <http://floridafirst.ufl.edu>

On the cover: Horticultural scientist Jonathan Crane bites into a carambola, or star fruit, one of the many Caribbean fruits and vegetables being studied by scientists at the Tropical Research and Education Center in Homestead.

Photograph by Thomas Wright.



Institute of Food and Agricultural Sciences

IMPACT

Volume 15, No. 3

Spring 2000



Urban Focus

The Fort Lauderdale Research and Education Center helps solve environmental problems and enhances the quality of life in South Florida. **4**

8 Everglades Agricultural Area

Best management practices help farmers protect environmentally sensitive areas.

12 Education at Your Doorstep

With new distance education technologies, UF's College of Agricultural and Life Sciences offers classes statewide.

14 Southernmost Solutions

Located in Homestead, the Tropical Research and Education Center is the only university facility of its kind in the continental United States.

18 A Salty Problem

Algae blooms provide a sign that something's amiss with fragile Florida Bay.



Putting down roots

4-H project turns barren land into a garden.

26

29 Eat better, live better

A Hialeah nutrition education program helps the Hispanic population make the most of limited resources.

32 UF/IFAS Updates

Florida Earth Project

Students and professionals can learn about Florida's environmental issues.

Ask the master

Florida ecotourism gets help from Master Naturalists.

Silicon success

New research indicates this element controls diseases and boosts crop yields.

35 UF/IFAS Resources

Affordable Housing

Dreams come true in Collier County through a collaboration of UF/IFAS extension, banks and county government.

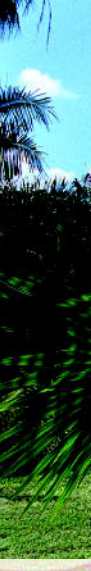
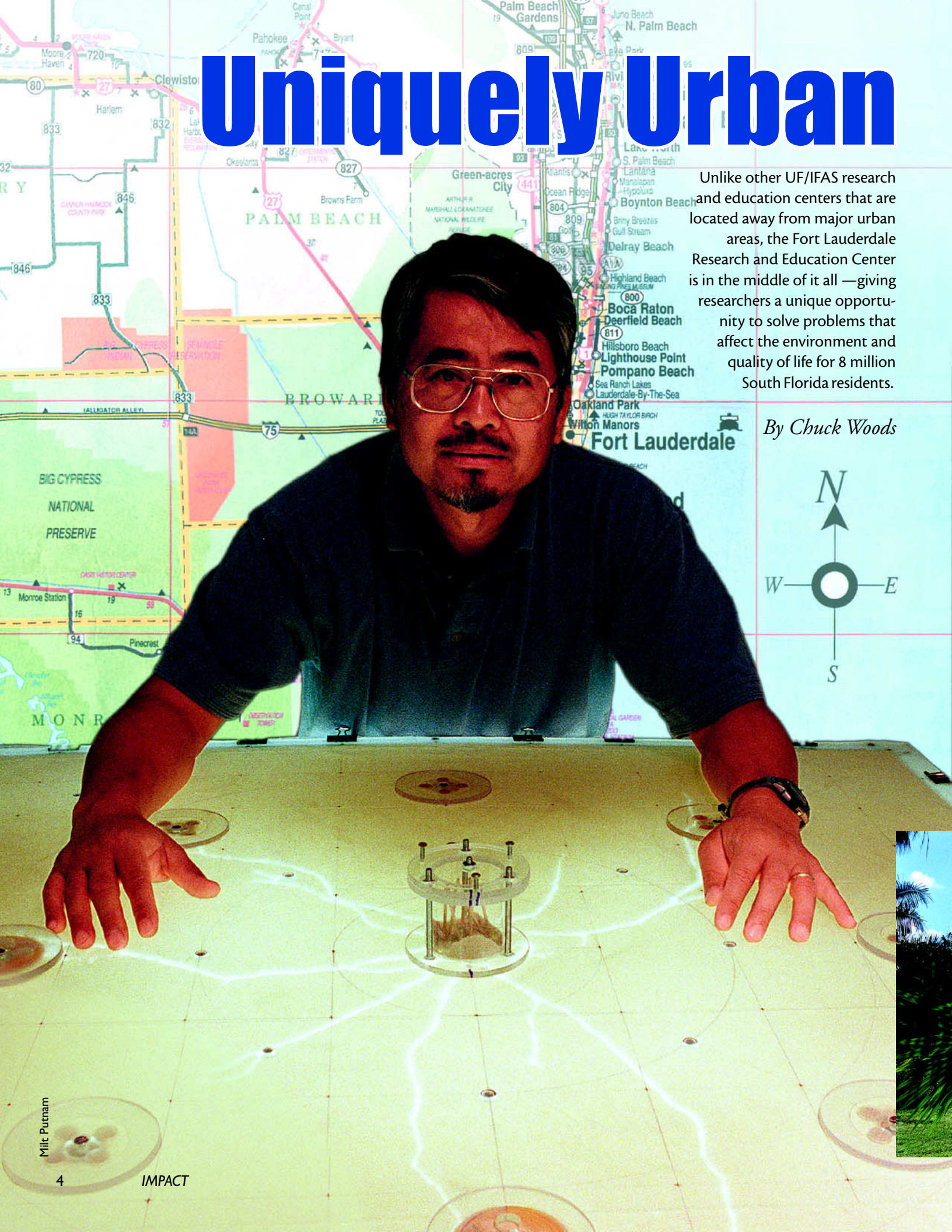
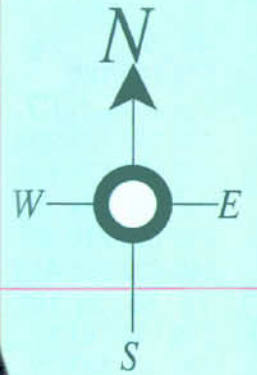
22



Uniquely Urban

Unlike other UF/IFAS research and education centers that are located away from major urban areas, the Fort Lauderdale Research and Education Center is in the middle of it all —giving researchers a unique opportunity to solve problems that affect the environment and quality of life for 8 million South Florida residents.

By Chuck Woods



Extending more than 100 miles from South Miami to the Palm Beaches, the Southeast Florida urban corridor is one of the nation's largest and most environmentally sensitive.

Next to this megalopolis are the delicate ecosystems of Biscayne Bay and Everglades National Park, which are being damaged by nutrients in groundwater runoff from coastal cities. In addition to water quality problems, urban and natural areas are being attacked by invasive plants, plant diseases, termites and other pests.

To deal with these and other issues unique to the South Florida environment, scientists at the UF's Fort Lauderdale Research and Education Center (REC) have a variety of projects under way at the 100-acre urban campus.

"Because many of the problems being studied are associated with high density development in close proximity to sensitive natural resource areas, the Fort Lauderdale site is ideal for such research," said Joan Dusky, acting director of the center, part of UF's Institute of Food and Agricultural Sciences (UF/IFAS).

She said the center also offers hundreds of local, place-bound students an opportunity to earn a UF College of Agricultural and Life Sciences degree in entomology, environmental horticulture or turfgrass management – degrees not offered by any other state university in the area.

"Our research is focused on urban issues, particularly those with regard to the interface between urban and natural areas of Southeast Florida," Dusky said. "Since the urban coast is contiguous to many natural resource areas, water quality and conservation are a top priority.

"All the fertilizer, pesticides and other chemicals used in the urban areas, including lawns and parks, have a tremendous impact on the Everglades natural area as well as the coastline. Much of our research is aimed at the judicious use of these compounds, thus reducing the potential for groundwater contamination.

Left, Nan-Yao Su, recognized as a world expert on the highly destructive Formosan termite, is using a specially designed "foraging arena" to observe the tunneling behavior of subterranean termites.



Milt Putnam

"Other major research focuses on invasive plant management, aquatic weed management, structural pests as well as other disease and insect problems – all issues of concern in South Florida," Dusky said.

With hundreds of golf courses dotting the South Florida landscape – and dozens more under construction – overuse of fertilizer and pesticides could threaten groundwater quality. To reduce the potential for damage, particularly from nitrogen and phosphorous, researchers at the center are measuring how much fertilizer is needed to keep the greens green.

John Cisar, professor and coordinator of UF's turfgrass research program, and George Snyder, distinguished research professor and soil chemist, are developing a series of best management practices for fertilizer and pesticide use on golf courses and sod farms in South Florida. Many of their research findings are being used by UF/IFAS extension agents in the statewide Florida Yards and Neighborhoods education and demonstration program to help homeowners protect groundwater resources.

Cisar and Snyder have developed a new product called "BioSand" that serves as a filter of pesticides on golf courses.

"Basically, we have coated sand with a special polymer from sugarcane waste that grabs organophosphate pesticides," Cisar said. "Used as the bottom layer of sand in golf greens, it could help prevent pesticides and other chemicals from leaching into groundwater over its expected 10- to 15-year lifespan. That's just about the average lifespan of a green, too."

Cisar, who also is evaluating turfgrasses for golf courses, landscapers and homeowners, said new "ultra-dwarf" bermudagrass varieties have the lower mowing heights golfers prefer. The new varieties are now available to commercial producers.

Fastest Growing

Another important area of research at the Fort Lauderdale REC involves production of ornamental plants, the fastest growing sector of Florida agriculture because of the state's booming population growth. In South Florida, growers sold \$697 million worth of ornamental plants in 1997.

Timothy Broschat, professor of tropical ornamental horticulture, is conducting various fertilization and transplanting studies in a five-acre palm grove at the Fort Lauderdale REC.

"A key part of our research is aimed at identifying the causes of specific nutritional disorders, determining which fertilizer sources are most effective in treating these problems and developing optimum methods for delivering nutrients to plants without contaminating the environment," he said.

Broschat's other major work involves palm horticulture, including studies on the best methods for transplanting large specimen palms. His research has set industry standards in South Florida for optimum root ball size and transplanting age as well as tying and removal of leaves.

The Fort Lauderdale Research and Education Center includes a mature, five-acre palm grove for teaching and research.



Milit Putnam

Above, John Cisan, checks bermudagrass test plots at the Fort Lauderdale Research and Education Center.



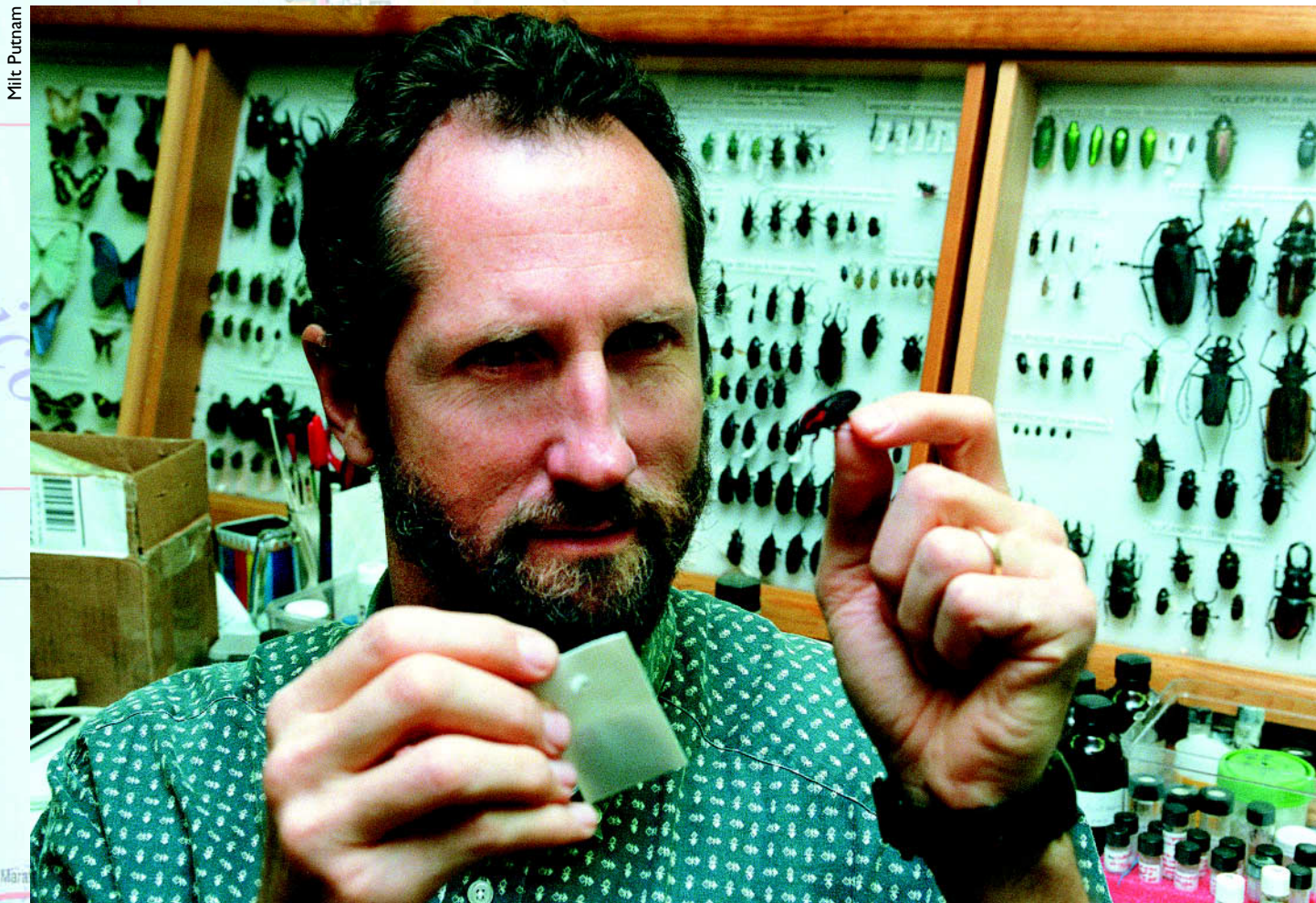
Milit Putnam

Right, Monica Elliott holds a palm stump with *Ganoderma* conks, which are large, mature fungal growths that produce spores to spread the disease.

Despite the best efforts to protect these expensive ornamental plants, all Florida palms are threatened by a lethal fungal disease known as *Ganoderma* butt rot, according to Monica Elliott, associate professor at the Fort Lauderdale REC, who is searching for solutions to this serious problem.

“It’s No. 2 on the list of the ten worst diseases of ornamental plants,” said the soil-borne disease expert. “It does not attack a palm until the plant has formed woody tissue in its trunk, which means the disease usually shows up years after the slow-growing palms have been nurtured from seeds. Worse yet, there are no controls, either preventive or curative, for the disease. And we can’t predict which trees will become diseased.”

Elliott, who initiated research on the malady in 1994, says the work will be long-term and costly because only mature palms (palms with trunks) can be used for field studies. One of her first goals was to develop a small-scale research protocol for working with the disease.



Milit Putnam

Robin Giblin-Davis examines a male palmetto weevil that produces pheromones that attract other weevils of the same species. The pheromones are then used in baiting traps.

“This entails using small blocks of palm wood, so only one palm has to be sacrificed instead of the ten or more for each experiment,” she said. “Since the disease is normally restricted to the lower four feet of trunk, most fungicides are ineffective. Future research will examine products, biological and chemical, and techniques that will concentrate fungicidal materials in the lower trunk without harming the palm.”

Melaleuca Menace

Spreading at the alarming rate of 15 acres every day, melaleuca, the paperbark tree brought to Florida from Australia about 100 years ago, has become one of the state’s most troublesome invasive plants.

“It’s overwhelming the Everglades and coastal wetlands,” said Robin Giblin-Davis, professor of entomology at the center. “More than \$2.2 million is being spent annually trying to control the tree, with losses to the local economy ranging as high as \$168 million.”

To slow – and hopefully stop – melaleuca’s rampage across South Florida, Giblin-Davis is working with the U.S. Department of Agriculture to find effective natural predators to control the tree without pesticides.

“In 1997, a leaf-eating weevil, the melaleuca snout beetle, was successfully released in Broward County, and it’s starting to show some promise,” Giblin-Davis said. “We’re also testing some other biological control agents we found in Australia with the help of USDA.”

Giblin-Davis said studies have shown that a small fly (*Fergusonina*) and a microscopic nematode attack the flower and leaf buds of the melaleuca tree, preventing seed development.

“Preliminary research suggests these two biocontrols working together are very host specific, which means they should not become a problem on other plants in Florida,” he said. “This bodes well for releasing the Australian fly and nematode parasites into southern Florida as another natural, non-chemical way of controlling the invasive tree.”

In other research, Giblin-Davis is developing traps to protect expensive Canary Island date palms from the North American palmetto weevil and prevent destructive South American weevils from invading the state. Widely used as a signature plant in South Florida landscapes, the palms are expensive, with retail costs for a 15-foot palm running as high as \$5,000. In 1997, the pest killed palms valued at \$400,000 in just one nursery. Industry-wide losses were higher.

“We have identified pheromones, chemicals that attract the weevil, and we’re using them to monitor and trap the pest before it invades palms,” Giblin-Davis said. “However, traps must be used carefully because they can end up attracting more weevils to a site where palms are being grown or planted.”

He said they’re informing palm growers and others about the potential risks of the pest. Since early weevil infestations are not easily diagnosed, palm growers are being urged to

use prophylactic pesticide treatments at the time of pruning, stress or transplanting. Giblin-Davis is using pheromones to trap a destructive sugarcane weevil in the Everglades Agricultural Area, too.

To protect turfgrass against the destructive sting nematode, Giblin-Davis is developing new natural biological methods that control the microscopic root-feeding animal. The pest is a major problem on golf courses, athletic fields and lawns in the southern United States. Current pesticide control measures may contaminate ground water and be toxic to people and wildlife. To get around this problem, Giblin-Davis has found a bacterium (*Pasteuria*) that parasitizes the sting nematode. His research may result in the development of a commercial biocontrol product.

Super Termites

Subterranean termites have always been a problem in Florida, but the Formosan “super termite” has become a real “millennium bug” for residents and pest control operators. The pest – 10 times more destructive than regular subterranean termites – apparently arrived in the United States in the early 1950s aboard ships from the Far East. Now this swarming little nuisance is spreading rapidly in Florida and the Southeast. The pest, which has gnawed its way up the Florida’s east coast to Jupiter, also has been found in Tampa, Pensacola and Orlando.

Fortunately, researchers at the Fort Lauderdale REC have developed new methods to detect and control the Formosan termite as well as regular subterranean termites – the first major breakthrough in termite pest control in 50 years.

Nan-Yao Su, professor of entomology and a world expert on the highly destructive Formosan termite, has developed a new monitoring and baiting system that uses pesticide (hexaflumuron) only when termite activity has been detected.

Timothy Broschat checks the effectiveness of various fertilizers applied to foxtail palms at the Fort Lauderdale Research and Education Center. He said many palms in the South Florida landscape are deficient in iron because of the area’s limestone soils.



Milt Putnam

The system is licensed by the UF to Dow AgroSciences, which markets the product as the Sentricon Termite Colony Elimination System.

For more than a decade, Su has been working with communities in South Florida to control the pest. Recently, the entire city of Golden Beach, located near the Miami-Dade/Broward County line, agreed to become part of an ongoing UF/IFAS research project to eliminate the pest from its boundaries. The city has been plagued by the pest. Su also is working with the National Park Service to control the pest at national landmarks in New Orleans, Puerto Rico and the U.S. Virgin Islands.

To further improve control methods, Su has initiated new research to determine the tunneling behavior of the Formosan termite and the eastern subterranean termite. “We

want to determine how these termites respond when confronted with areas loaded with wood or without wood, comparing branching patterns and how fast they construct tunnels,” Su said.

All About Aquatics

Aquatic plants are another major concern in South Florida’s fragile environment. Working with the UF/IFAS Center for Aquatic and Invasive Plants in Gainesville, David Sutton, professor at the Fort Lauderdale REC, is developing methods to manage exotic, invasive weeds such as torpedograss and hygrophilia while also promoting the ornamental value of other aquatic plants.

“Torpedograss is a major weed along shoreline areas,” he said. “It produces rhizomes below the soil surface that are difficult to kill, and we are evaluating different herbicide timing and application rates to inhibit their growth. We’re also evaluating different herbicides to control hygrophilia, a major weed problem in many South Florida canals.

“Recently, we have been able to show that hygrophilia plant produces seed, and we are trying to determine factors that initiate flowering, seed production and seed germination. We have found that hygrophilia grows much better in some areas. We’re looking into the nutritional requirements of the plant to determine where it might be more of a problem,” Sutton said.

Two native aquatic plants, sky flower and pond apple, have potential as ornamentals, he said.

“With its deep blue petals, bright yellow stamens and dark green leaves, sky flower could be used by homeowners in small ponds and garden containers,” Sutton said. “We would like to introduce pond apple into the residential landscape, too. It may grow well in wet areas or along the shoreline of small ponds. It produces an attractive flower as well as an apple that can be made into jellies and jams. However, the apple is not eaten raw like regular apples.”

Sutton said they’re using slow-release fertilizers to help provide a constant amount of nutrients for the new aquatic ornamentals and prevent nutrients from leaching into water and causing algae problems.

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David Sutton is evaluating hybrid water lilies grown with a controlled release fertilizer. Culture of these and other aquatic plants with a slow-release fertilizer added to a sand rooting medium results in excellent production with very little loss of nutrients or contamination of groundwater.

BMPs make a difference

Scientists at the Everglades Research and Education Center in Belle Glade are developing best management practices (BMPs) to improve and protect water quality in the Florida Everglades. It's all part of an ambitious \$7.8 billion federal plan to restore one of the world's most endangered ecosystems.

By Chuck Woods



Laboratory technician Maria Fabelo, left, and Forrest Izuno examine particulate matter in a water sample prior to chemical analysis.

When it comes to national issues involving agriculture and the environment, restoration of the Florida Everglades is one of the most challenging.

“How we solve this problem is being closely watched by farmers, water management officials and environmentalists across the nation and around the world,” said Forrest Izuno, water management professor with the UF’s Institute of Food and Agricultural Sciences (UF/IFAS). “Many look at the Florida Everglades issue as the poster child for the sustainability of agriculture in the face of mounting environmental concerns.”

Farming—mainly sugarcane, vegetables, rice and sod—in the 505,000-acre Everglades Agricultural Area (EAA) generates more than \$1 billion a year in economic activity. During the past 20 years, much attention has been focused on the negative impacts of phosphorous in drainage water pumped from the EAA, particularly its effect on ecosystems in Everglades National Park and Florida Bay. Located south of Lake Okeechobee and north of the Water Conservation Areas, this tract of productive agricultural land is in the middle of two environmentally sensitive areas.

To help restore and protect water quality in the Florida Everglades, scientists at the Everglades Research and Education Center (REC) in Belle Glade are working with the Florida Department of Environmental Protection, South Florida Water Management District (SFWMD), the Everglades Agricultural Area Environmental Protection District and individual growers. UF/IFAS researchers have developed and implemented a series of highly successful best management practices (BMPs) for the EAA that have already reduced basin-wide phosphorous loads in drainage water by an average of 50 percent. Some farms have achieved phosphorous load reductions up to 80 percent.

SFWMD reports that phosphorous loads entering environmentally protected areas south of the EAA have been reduced by an average of 50 percent (peaking at 67 percent) during the past five years – double the 25 percent mandated by the 1994 state Everglades Forever Act. During the last five years, phosphorous concentrations leaving the EAA have declined from an average of 173 parts per billion (ppb) to an average of 100 ppb.

Izuno said additional 10 to 25 percent reductions may be achieved when BMPs to control particulate transport of phosphorus (insoluble phosphorous in drainage water) are fully implemented in the next three years.

“These data show that the BMP program has greatly reduced phosphorous runoff to environmentally sensitive areas – actually reducing phosphorous concentrations to levels lower than those found at the source,” Izuno said. “From this we can conclude that our BMP program has enabled the agricultural lands to become a phosphorous ‘sink’ or filter for South Florida.”

Working with Izuno at the Everglades REC on various aspects of the BMP program are Ronald Rice, crop nutritionist and assistant professor; Timothy Lang, environmental agronomist; Jim Stuck, environmental engineer, and Laurene Capone, biologist and project manager.



Milt Putnam

Timothy Lang checks optical sensors which measure revolutions per minute at a pump station in the Everglades Agricultural Area.

Rice, who also directs the Everglades Soil Testing Laboratory at the center, is measuring the nutritional requirements of various crops and how different drainage practices and phosphorus levels affect crops and long-term soil fertility trends. To accomplish this, he is using 25 lysimeter fields – fields that are closed off to surrounding areas so that all water and nutrient inputs and outflows can be tracked.

To further improve BMPs that limit the amount of nutrients leaving EAA farming areas, Lang and Stuck are measuring the amount of phosphorus discharged in both soluble and particulate forms. Soluble phosphorus can be absorbed or utilized by plants while particulate phosphorus is not immediately available to plants and serves as a reservoir for future release of this element.

Capone oversees many of the daily aspects of the BMP project, coordinating laboratory work, assembling data and managing budgets. She also serves as the contact person with local, state and federal government groups. Her responsibilities include ensuring that all facets of the program adhere to strict procedural guidelines and performance requirements set forth in the project’s quality assurance plan.

Izuno said the UF/IFAS research and extension program has changed the fertilizer, water management and crop rotation practices being used by growers, as well as their philosophies for operating in the EAA. The primary BMPs implemented are water management related, involving water table and pump management to uniformly drain farms in a manner that will not be detrimental to crops or the environment.

“Over-drainage of farms is being curtailed,” he said. “More water is being stored on farms to be reused or drained through evaporation or transpiration. Water and phosphorus that would otherwise have left the farm, particularly during heavy rains, are being rerouted around the farm to more water tolerant areas and crops.”

Under the BMP program, agricultural drainage pumping at the farm level has decreased by approximately 25 to 30 percent and average water tables in the EAA have risen by about three to four inches. As a result, growers have been able to achieve adequate drainage and reduce water table variability, which leads directly to a reduction in soil subsidence and prolongs viability of agriculture in the EAA.

Izuno said secondary BMPs include fertilizing according to scientific soil-test recommendations, proper handling of fertilizer and keeping crops with high phosphorus drainage loads away from the main pumping stations.

“Growers have had to accept the fact that higher levels of management are necessary for sustained agricultural production and that environmental considerations are an important part of their production plan,” he said.

“More water is being stored on farms to be reused or drained through evaporation or transpiration. Water and phosphorus that would otherwise have left the farm, particularly during heavy rains, are being rerouted around the farm to more water tolerant areas and crops.”

Forrest Izuno

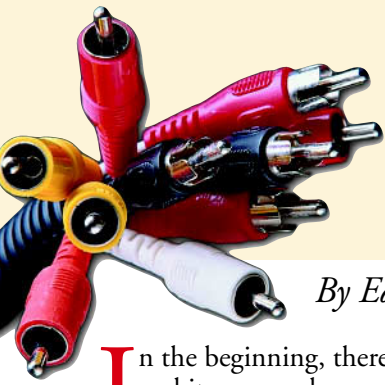
Rice said the re-use of water on-farm also results in higher water tables, an issue that is being explored with the lysimeter field. “The bottom line is that growers and UF/IFAS researchers are redesigning farm water management and cropping systems to ensure agricultural sustainability while also protecting wetland ecosystems in South Florida.”

Forrest Izuno, izuno@gnv.ifas.ufl.edu

In a field of green and red leaf lettuce, Ronald Rice examines roots to determine how reduced fertilizer levels affect plant growth.

Milt Putnam





UF/IFAS Distance Education Program heads into new century

New funding to establish program in Homestead

By Ed Hunter

In the beginning, there was the correspondence course, and it was good.

Students without access to college courses could complete them by mail. But there was little or no interaction between student and professor and no interaction with other students.

Then came courses on videotape and two-way interactive television. Now students could see their instructors. Courses could include video demonstrations, Power Point slide shows and, in the case of two-way TV, students in remote locations could talk with the instructor and their fellow classmates.

The Internet allowed course material such as class notes and diagrams to be posted on World Wide Web sites. Interaction between professors and students grew even more through e-mail and online chatrooms.

But faculty and administrators in the University of Florida's Institute of Food and Agricultural Sciences still don't believe they have quite hit the pinnacle of distance education. They want more courses to have online components, including more Web-only courses, and they want courses to originate from each of the nine video conferencing facilities located at UF/IFAS research and education centers, including the Tropical Research and Education Center (REC) in Homestead, the Southwest REC in Immokalee and the Fort Lauderdale REC.

"We do the interactive video very well because of the tremendous infrastructure development we've had here," said Jane Luzar, UF/IFAS associate dean for academic programs. "But increasingly what we're doing is our World Wide Web offerings. We've offered some earlier courses, and one we did last semester showed us the potential."

As part of a new Internet-based master's program in agriculture, the College of Agricultural and Life Sciences offered a course in agribusiness human resource management that was taught entirely on the Web. Food and resource economics Assistant Professor Allen Wysocki said he felt teaching the course on the Web had certain advantages over courses taught using interactive video in terms of each student's schedule.

"I think the students benefited. Almost all of my students were online late at night doing their weekly readings," Wysocki said. "The Web-based nature of this course allowed the students the flexibility to learn the material at their own pace."

Wysocki said he and course co-developer Karl Kepner, UF/IFAS distinguished service professor of food and resource economics, have tried to take advantage of all the tools available to add variety to the course.

"Karl Kepner and I incorporated two or three bulletin board assignments, where the students respond to questions and they would interact amongst themselves, discussing these leading questions," Wysocki said. "We tried to simulate the in-class experience by hosting a once-a-week chatroom for about an hour and a half."

And it's that effort by instructors to combine methods of teaching that Luzar said will be the key to creating successful distance education courses in the new millennium. Students will benefit most from courses that do it all, she said.

"Combining our interactive video with the Web and coming up with mixed media is what we think is probably the best approach to distance education," Luzar said. "The students have the advantage of seeing an instructor but also being able to do the truly asynchronous work that distance education offers. If you go back to the original concept of distance education, in many cases it's asynchronous – any time, any place."

One of those places in South Florida will see some changes in the near future. Part of \$200,000 in new funding for distance education will bring improvements to the distance education classroom in Homestead along with a new program in environmental horticulture.

"We'll be working with faculty from Fort Pierce, in addition to faculty from Gainesville to deliver classes in agricultural business management to Homestead," Luzar said. "And as we do that, we're opening up the next level of our distance education program, where we're talking about not only emanating from Gainesville, but instead being able to do localized broadcasts."

But right now, Gainesville is the UF/IFAS distance education hub. The control center is located in room G-001 in McCarty Hall. G-001 is a lecture hall that has been completely equipped for distance education, with the capability to show slide presentations, video clips and the video presenter – a distance education version of an overhead projector that allows instructors to display a portion of a textbook or any kind of printed matter.

The room features several remote control cameras that can zoom in on any student in the classroom as well as four TV monitors so students in Gainesville can see both what is being transmitted to the remote sites as well as their classmates around the state.

During the Spring 2000 term, environmental horticulture Assistant Professor Dave Clark taught a distance education version of a required undergraduate course in horticultural physiology. On Monday and Thursday evenings, Clark met in G-001 with about 34 students who were joined

by 26 others via the interactive video conferencing network from Fort Lauderdale, Fort Pierce and Milton.

In one class session, Clark lectured on several aspects of the process of photosynthesis. He made use of a variety of media, including a Power Point presentation of class notes, pages of the course textbook displayed on the video presenter and a short video starring one of his graduate students demonstrating a lab procedure. Students with questions need only speak up and they can be heard in the Gainesville classroom. And in Gainesville, students with questions push a button on their desk and a camera automatically zooms in so they can be clearly seen at the remote sites.

Clark said he likes to take full advantage of the interactive nature of the video conferencing system by having his students get on camera to answer extra-credit questions. He said in addition to providing a review, the questions help the students get to know one another.

"I'll go through the roll, I'll say 'Joe Smith out in Milton do you want to step up to the plate.' If they get on camera, they get one point on the next test," Clark said. "Then I ask them the question. It serves as a review, and if they get it right, they get a second point.

"It keeps them up to date, plus it lets them see what my exam questions are going to be like," he said. "Plus the students in Gainesville know Joe Smith, by the end of class they've seen him three times."

Efforts by faculty members like Clark and Wysocki help students in the distance education courses get the same benefit from courses as students taking the course on the Gainesville campus. And while there haven't been any formal studies, Clark said he can't see any difference in the students' performance.

"I would teach my regular class five days and then come back and teach the night course, the distance course," Clark said. "The students in the distance education course were scoring the same on the tests. We found that performance-wise there wasn't really any difference between the traditional class and the distance class."

Administrators also point out that distance education allows UF/IFAS to save money as it pursues its mission of putting Florida FIRST (Focusing IFAS Resources on Solutions for Tomorrow).

"It's a smart way to do it, because we are able to deliver with one faculty member what otherwise would be delivered to very small classes by three faculty members," Luzar said.

Luzar said another advantage of distance education is that it allows students, especially in the distance education master's program, to pick and select among the best elective courses for their program from the top schools nationwide.

"In a graduate program you generally have a core of courses and electives. Perhaps some of those electives would be offered by the best person in the national field at Purdue or Cornell," Luzar said. "It gives you the opportunity to put together a superior degree program and that's our goal."

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Thomas Wright



Tropical Research and Education Center Director Waldemar Klassen, right, reviews the spring distance education class schedule with horticultural sciences Associate Professor Jonathan Crane in the distance education classroom in Homestead.

Eric Zamora



Above, environmental horticulture Professor Dave Clark makes a point during a session of his Spring 2000 distance education class in horticultural physiology. Clark taught 34 students who met in the UF/IFAS distance education classroom in G-001 McCarty Hall while 26 other students in Fort Lauderdale, Fort Pierce and Milton viewed the class over the UF/IFAS interactive television network.

Below, food and resource economics Professor Allen Wysocki taught an Internet-only course in the Fall 1999 term on agribusiness human resource management. Wysocki said that having the course entirely on the Internet made it more flexible for his students.

Eric Zamora



Tropical Research and Education Center

It's the only university facility in the continental United States that focuses on a large number of tropical and subtropical crops.

By Ed Hunter

As its name suggests, the Tropical Research and Education Center (REC) in Homestead is like no other facility in the UF's Institute of Food and Agricultural Sciences.

The center conducts research on tropical fruits, vegetables, nursery and ornamental crops in addition to important environmental problems in the southern portion Miami-Dade County. At the same time, an expanded teaching program at the center will allow students to earn a bachelor's degree in environmental horticulture from the UF's College of Agricultural and Life Sciences.

Established in 1929, the 160-acre campus at the Tropical REC includes fruit orchards, vegetable fields, greenhouses, laboratories, offices and classroom facilities. Fifteen faculty members and a support staff of about 45 perform a variety of research and education programs that serve growers, students and consumers in one of the state's most environmentally sensitive areas.

Agriculture and the Everglades

With the restoration of Everglades National Park on the horizon, some growers may be concerned that their interests may be plowed under in the name of restoring the famed River of Grass.

But one Tropical REC researcher says that not only isn't agriculture standing in the way of restoration, it probably will turn out to be one of the restoration effort's best partners.

"A lot of the work being done here is to try to make agriculture compatible with Everglades restoration," said UF/IFAS plant physiologist Bruce Schaffer. "In the past, agriculture has been seen as an opposing force to the natural ecosystem.

"But agriculture is a good partner in the restoration effort. Without agriculture, fallow land adjacent to the Everglades would be subject to invasion by weeds which may pose a threat to the surrounding natural ecosystem and developers would be building on land near the Everglades," he said.

So Schaffer and vegetable crop specialist Stephen O'Hair are working on developing best management practices for several popular South Florida fruit and vegetable crops.

"We want to develop agriculture practices that utilize all the inputs for the crops, yet don't result in leaching of chemicals into the aquifer," Schaffer said. "This work is particularly important, since water quality standards will be set for Everglades National Park."

Schaffer said the project is funded in part by money from the Florida Department of Agriculture and Consumer Services, the South Florida Water Management District and the United States Environmental Protection Agency.

Virtual Field Laboratory

Say a student in Minnesota wants to get some first-hand experience with tropical fruit production. At the moment, traveling to the tropics is the only option. But if the plans of Schaffer and tropical fruit crop specialist Jonathan Crane come to fruition, that experience will be no further away than an Internet-connected computer.

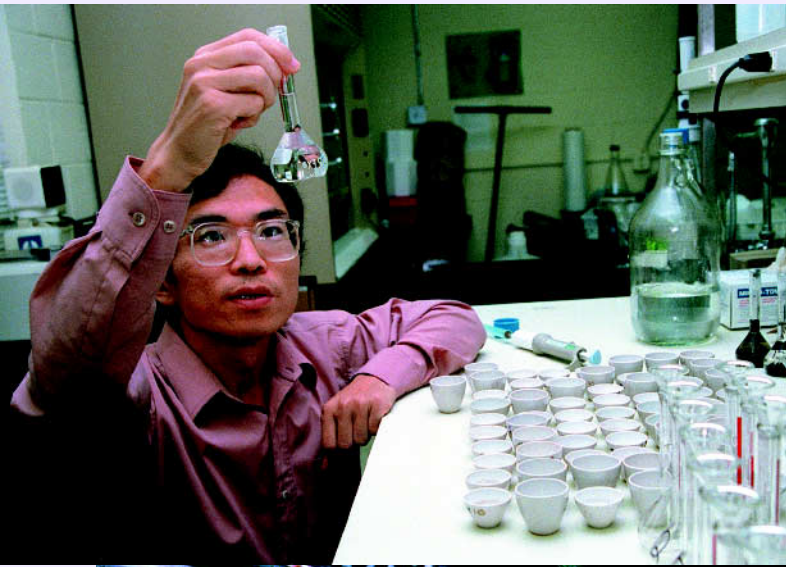
With funding from a USDA challenge grant and the Florida FIRST (Focusing IFAS Resources on Solutions for Tomorrow) initiative, the two researchers are in the early stages of developing a multimedia Web site they have dubbed the Virtual Field Laboratory.

"Many national and international students studying agriculture in temperate climates are interested in the tropics and tropical agriculture, but they don't have any practical experience or opportunity to observe the biology and production of tropical fruit crops in the field," Schaffer said. "The virtual field laboratory will be a Web-based, interactive, multimedia course that will bring the tropics to the students through the Internet."

Improving Lychee Production

Lychee trees were first introduced to Florida in 1883. The trees produce a thick-skinned fruit that is as red as a strawberry. First grown in Southern China, it has always been popular in Asian communities, but is beginning to develop a substantial following among American consumers as well.

"Lychee is a relatively new cash crop," said Yuncong Li, a UF/IFAS plant nutritionist. "It is a small, high-value tropical fruit crop that now has a high demand in the market."



Left, plant nutrition Assistant Professor Yuncong Li examines a water sample in his lab.

Thomas Wright



The work of Richard Litz, a professor of horticultural sciences, has resulted in the rescue from extinction of a species of Central American cycad that had completely disappeared in the wild.

Eric Zamora

But Li said while lychee trees grow in Florida, the unpredictable weather can cause problems for the trees, resulting in inconsistent flowering and fruiting. So Li and Tom Davenport, a UF/IFAS reproductive physiologist, are heading up a project to try and determine how growers can assure a reliable yield.

“The trouble is, Lychee trees are unreliable,” Li said. “Some years you will get a lot of flowers which will turn into fruit, and some years you will get nothing. If you get years where the temperatures are relatively high, the trees will only produce new leaves and no flowers.”

Li said the preliminary results indicate that growers can better manage their lychee crops by controlling the amount of nitrogen in the soil.

“We feel if we fertilize correctly we can induce more flowering, so we are developing a program to manage nitrogen fertilizer for the Lychee crop,” Li said. “But if you put too much nitrogen in the soil, you can jeopardize your Lychee yield.”

Soil Phosphorus

Another side of the fertilizer equation is phosphorus. Many environmentalists have tagged phosphorus as the bad boy of fertilizers—linking it both to problems in the Everglades and decreased water quality in general.

Thomas Wright

Nevertheless, UF/IFAS researchers say phosphorus is an essential part of the equation when it comes to obtaining healthy fruit and vegetable crops with good yields.

“Without phosphorus, you can’t get a good crop, especially in South Florida soil,” Li said.

Since the virgin soil was deficient in phosphorus and required the addition of phosphorus to make it productive, Li said farmers believed that the crops needed large amounts of phosphorus in order to grow. For years farmers have added two to three times the amount that was actually needed to grow healthy plants. The result, he said, is that the farmers have ended up actually creating soil that is phosphorus rich.

“After 50 years of farming, the soil is loaded with phosphorus that is available to the crops,” Li said. “Our soil has plenty of phosphorus, so growers can reduce phosphorus application.”

“In some cases they don’t have to use any, or they can significantly reduce the amount of phosphorus they do use,” he said.

Associate Professor of horticultural science Jonathan Crane, right, and graduate student Hilary George examine carambola trees that have been treated with mulch to control soil temperatures. George is studying horticultural science under the Dennis Carpenter Memorial Fellowship, which is given by the Miami-Dade County AgriCouncil.



Li said current research with tomato and potato crops has shown that the growers can take the phosphorus already present in the soil into consideration when calculating fertilizer application rates.

“Not only are we protecting water quality and the ecosystem, but growers can save money and reduce production costs,” Li said. “Growers are starting to cut fertilizer applications and some are not even using phosphorus fertilizer with their crops.”

Virus Resistant Papaya

Papaya is an important cash crop in South Florida, where the warm climate is perfect for the fruit, which has a very low tolerance for cold temperatures.

One of the biggest challenges facing the papaya industry in Miami-Dade County and the Caribbean region is the papaya ringspot virus. Plant pathologist Mike Davis is working to develop new varieties of papaya that are resistant to the virus using the latest techniques in molecular genetics.

Davis said the first test plants were grown and were exposed to the virus to see if any exhibited the desired resistance.

“Out of 257 transgenic lines inoculated with the ringspot virus from Florida, 48 appeared to be immune or highly resistant to the virus,” Davis said. “We now seek to enhance commercial papaya production in the Caribbean region by producing papaya-breeding lines with the resistance to ringspot virus.”

Of the 48 lines that were very resistant, 24 were selected for further study. “We’re just about ready to get our first fruit, and then we will test to see how resistant the progeny are,” Davis said.

Once the researchers have determined that the resistance is inherited, Davis said the next step will be to use a procedure called “backcrossing” to try to introduce the trait for resistance to the virus into other commercially farmed papaya varieties.

“The backcrossing will probably take five to six years,” Davis said. “We are cooperating with the University of Puerto Rico, which will be doing the back crosses because it is warmer there and they can get more crossing cycles in less time.”

Saving Plant Species

Cloned animals have been making headlines, from Dolly the sheep to the recent set of piglets. But genetic techniques have much broader applications, say Homestead-based researchers who are working to save plant species from extinction.

“We are working on a method of cloning very ancient plants called cycads,” said Richard Litz, a fruit biotechnology specialist. “They’re very primitive evergreens. They are the earliest, most primitive of all the plants that date back to the Jurassic.”



Eric Zamora

Plant pathology Professor Mike Davis is working to develop varieties of papaya that are resistant to the papaya ringspot virus.

Litz said that in addition to their historical importance, cycads, such as the sable palm, are prized as ornamentals. But he said many of the cycad species are on the verge of extinction, and one type of cycad from Central America has disappeared from the wild.

“One species of cycad was discovered in Central America in 1986 or ‘87 and there were only 30 individual plants found,” Litz said. “When researchers returned three or four years ago, there were no plants left.”

“However, the original discoverers had taken three or four plants back to a botanical garden in Mexico,” he said. “We have used pieces of leaves and we have been able to regenerate this species from leaves, and have thousands of plants in the laboratory. We have rescued this species from extinction.”

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A sunset over a body of water with a tree silhouette on the right. The sky transitions from a deep blue at the top to a bright orange near the horizon. The water is dark and reflects the colors of the sky. The silhouette of a tree with many leaves is visible on the right side of the frame.

Thirsty *Florida Bay*

Florida Bay is suffering, like the Everglades on which it depends, from a lack of fresh water

By Cindy Spence

On the surface, the waters of Florida Bay appear to be the most unspoiled part of the South Florida environment.

With the Everglades to the north and the Keys to the south, Florida Bay is nestled at the tip of Florida, seemingly protected from the urban maelstrom. Mangroves line its shores and gentle breezes ripple the water, in a rustic scene rarely found now in other parts of Florida.

But below its placid surface, the bay is in decline. Sea grass beds are dying, leaving marine animals homeless. The main sign of life is a lower life form, an alga that floats on the surface.



*At sunset, Florida Bay
looks as pristine as ever.*

Thomas Wright

“The seagrass
beds support
sponges
and provide a
nursery ground for
lobster, shrimp,
snook and other
sport fish.”

Ed Philips



University of Florida algae researcher Ed Philips says the algae blooms perpetuate the decline of the bay by blocking sunlight the seagrass beds and seaweed need for photosynthesis. And as the seagrass beds die off, the marine animals that use them for nurseries also will disappear.

But the algae are a symptom of Florida Bay’s decline, not the cause. Florida Bay’s problems, Philips said, began with a lack of water.

For hundreds of years, fresh water coursed through the Everglades’ River of Grass, spilling into Florida Bay and mixing with sea water, to reach a delicate mix of fresh and salt water just right to nurture sponges, lobsters, fish of all kinds and lush beds of seagrass to harbor the sea creatures.

In the last century, however, the Everglades has had little water to spare as the River of Grass has seen its water diverted to other uses. Florida Bay is suffering, like the Everglades on which it depends, from a lack of fresh water.

Florida Bay, it seems, is dying of thirst.

Algae Blooms

As the desirable species decline, a species of algae called *Synechococcus* has gained a fierce hold on the bay, said Philips, an associate professor with UF’s Institute of Food and Agricultural Sciences.

Thomas Wright

Farms like this one about a mile from Everglades National Park have soaked up water that would have fed the Everglades and, eventually, Florida Bay.



Aided by a grant from the Florida Sea Grant College Program, Phlips has been studying Florida Bay and its algae blooms since 1993. He started out trying to find out what the blooms were, how much area they covered, and what caused them.

He quickly identified the algae as *Synechococcus* and found, uncharacteristically, that only one species of algae was responsible for most of the bay's algae blooms. He also determined that the blooms had the strongest hold on the north-central region of Florida Bay, one of four ecological zones. The area was 400 square kilometers, or one-fourth of the 1,600 kilometers of the bay.

Not so easy was determining the cause of the blooms. For culprits, Phlips looked to water flow from the west coast of Florida, anticipating that nutrient loading might be causing the blooms. That theory was not supported, and he turned elsewhere.

"Historically, there has been sheet flow through the Kissimmee River Basin through the Everglades to Taylor Slough and Florida Bay," Phlips said. "Now, little water is funneled through Taylor Slough to the bay and this increases the salt concentration. Salinity during drought periods, in fact, is higher than is normal for sea water.

"Salinity stresses the grasses, making them subject to disease. When the grasses died, that provided nutrients, and *Synechococcus* took advantage of that," Phlips said. "It's very salt tolerant, as much as any organism I've seen, so *Synechococcus* quickly dominated."

The blooms have repeated in part because *Synechococcus*, the most dominant organism on the planet, is so well-adapted to the bay's new environment. When starved for nutrients, the algae sink and sit on the bottom, soaking up nutrients from the mud. When it is sufficiently renourished, it becomes buoyant and the blooms reappear.

Now that his studies have shown that the algae are tapping into the decayed seagrass beds and other organic matter on the floor of the bay, Phlips said he would like to continue his research to find out how large the reserve of nutrients is.

"The nutrients come from sediments deposited over hundreds of years by the River of Grass and from the growth and die-off of the seagrass beds. How long will these reserves support the algae blooms?" Phlips asks. "We feel there's enough there to support the blooms for quite a long time."

Changing Ecosystem

In his four-year study, he found that seagrass beds did not rebound, even during periods when the algae were dormant. And, unfortunately, the seagrass beds are the key to the recovery of the bay.

"The seagrass beds support sponges and provide a nursery ground for lobster, shrimp, snook and other sport fish," Phlips said. "So they're important both ecologically and economically."

While the blooms are concentrated in the north-central region of the bay, they affect other parts of the bay and the



Thomas Wright

Ed Phlips examines a core sample taken from the center of Florida Bay just south of Tin Can Channel.

waters of the Keys. The blooms wash into coral reef areas, causing concern that they could harm the fragile reefs.

"The reefs of the keys are a unique habitat we don't want to lose," Phlips said. "Loss of the reef habitat may not be a global catastrophe, but it certainly would be a regional catastrophe. Florida derives billions from its tropical habitat, so we're not talking chicken feed."

Florida Bay has evolved and is now a restricted lagoon. With the algae blooms, many people would view the bay as "suboptimal," Phlips says, but actually it is still very productive.

As an algal culture, Florida Bay ends up with a different food web and risks losing some of the higher life forms Floridians view as normal and natural for that ecosystem.

And while Florida Bay would have evolved anyway, people have hurried its evolution along.

"Ecosystems evolve naturally, but we, through road-building, ditch-building and diversion of water, have created an unnatural system," Phlips said.

Returning Florida Bay to a more balanced state – one with less hypersalinity – would flush the system, leaving algae less time to bloom. Flushing the system, however, would require replumbing the Everglades, a project Phlips' research results support and which state and federal governments are funding.

"The role of this research is to provide information for good management of environmental resources. Water resources are a very valuable part of this state," Phlips said. "Everything is tied to water quality, and this is an issue everybody should be concerned about."

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Milt Putnam



IMPACT

Residents get help buying homes in Collier County

UF/IFAS Extension, banks and county government join forces to make dreams come true

By Serya Yesilcay



Gavin Jones, who was able to buy his condo with help from the Collier County home loan program, enjoys the view from his living room.

One of the first things Cyndi and Bob Kelly did when they bought their home was to paint the front door a flamingo pink to match the powderpuff blossoms in their front yard.

After Gavin Jones signed ownership papers for his condo, he adopted two kittens – something he could not do as a renter.

Both Jones and the Kellys were able to buy their homes through a program that helps Collier County residents with lower incomes achieve that goal.

But lower income takes on new meaning in a county where the median income is \$59,100, said Bonnie Fauls, a Collier County extension agent with the University of Florida's Institute of Food and Agricultural Sciences, who helped start the program.

Qualifying for home loans also can be difficult, even on a moderate income, when the median home price is \$205,000 and affordable rent starts at \$700, she said.

Enter the Collier County Home Loan Program, a consortium of 10 banks, the UF/IFAS Extension Service and county government, established to provide assistance for those who couldn't otherwise afford to buy homes.

Participating banks work together with the extension service to help applicants qualify for homeownership, said Nancy Merolla, vice president for community reinvestment and community compliance manager at Comerica Bank Florida.

"We require every borrower to attend a homebuying workshop presented by the extension service," she said, "so we feel comfortable that they have some training on budgeting and they understand the importance of making a mortgage payment and how to maintain a home once they're in it."

The role of the extension service is to help potential owners with topics from loan applications to assistance in what to look for in a home, Fauls said.

"We just don't put people in homes and walk away. We give them the prepurchase education and try to teach them as much as possible," she said.

Sitting in their new living room, surrounded by stacks of toys, the Kellys agreed their involvement with the program was a huge learning experience. "It was tough even when we did qualify," said Mr. Kelly. "There were other costs, like for the title, appraisal, inspection – we found out it was quite possible to have obstacles all along the way."



Nancy Merolla, left, and Bonnie Fauls have worked together from the start of the program to ensure smooth cooperation among participating banks and the extension service.

But they also had good help, Mrs. Kelly said. Marcy Krumbine, outreach coordinator for housing at the extension service, walked them through the process with more faith than they themselves had at times, she said. “She really kept on top of things more than we ever did ourselves. She would always call us and check in,” Mrs. Kelly said. “We feel very lucky to know Marcy.”

Krumbine teaches the workshops and also meets with clients individually, along with another Spanish-speaking coordinator.

“I tell people our program is a best-kept secret,” she said. “I’ll meet with them at their office; or like tonight, I’m meeting with somebody at the Central Library to prequalify them.”

Since the program began in 1996, 315 residents have become homeowners. “Our goal for the first year was to finalize 20 loans, but we ended up securing 78,” Fauls said. “The program clearly answered a need by targeting working people who can’t afford the price of a home, like teachers, deputies – basically, the working class.”

Outreach coordinator Marcy Krumbine, right, helped the Kellys with their loan applications and home buying education, providing a way for them to afford their new Naples home.



Jones is transportation planning manager for Collier County. Until he moved to Naples from Canada, he hadn’t even considered becoming a homeowner. But being in a lower income bracket here actually helped him qualify for assistance, he said. Drawing his living room curtains to reveal a poolside view framed by palm trees, he showed the pride of ownership.

“This is a good location and it has all the amenities,” he said. “The amount I paid in rent was almost the same, to the penny, to what I pay now including tax and condo fee.”

Borrowers have been more likely to qualify and keep their expenses low thanks to adjustments banks made in their application guidelines, Merolla said. “We waived a lot of our fees, expanded the debt ratio to allow people with lower incomes to still qualify,” she said. “We also relax our requirements for credit ratings so applicants can have a few credit delinquencies with letters of explanation.

“We just try to be more flexible overall than for someone who just walked in to a bank,” she said.

Actually, those who qualify don’t even have to walk into a bank, Merolla said. “The borrowers deal with the extension service from the minute they make a phone call or express their interest in buying a home, all the way to the closing process.”

Jones was able to complete his whole application from his desk. “I called in and then applied by mail,” he said. “The turnaround time for them to get my case rolling was a day.” Krumbine then went to his office to help fill out his final documents.

For others, the process can take time, Krumbine said. “We’ve had several people with really bad credit issues, where my mind would say ‘no way,’ but I’d tell them ‘this is what you need to do.’ I have seen people turn around and accomplish this huge task.”

Soon after moving to Naples, it became apparent to the Kellys that the only way they could afford to buy a home would be through the loan program. Mrs. Kelly had left a job as computer systems analyst to have more time for her children and become a foster mother. Even with her husband working, they soon found themselves facing the prospect of becoming a lower-income household, she said.

“It takes discipline to adjust to being in the lower-income bracket here,” Mr. Kelly said, “but then the quality of life is much better – we are now able to live in a safe, older and established neighborhood.”

Thanks to the loan program, they also were able to save on certain expenses most home buyers have, like being able to waive private mortgage insurance, he said. “We saved on having to pay up to \$100 a month for nine years; that would’ve added up.”

So far, all partners agree the Collier County Loan Program has been a success, bringing together extension, county government and banks in a unique collaboration. “The extension service has really helped connect potential clients to the banks,” Fauls said, and they have received a lot of inquiries about the program.

“While other Florida counties do have programs for homebuyer education or bank loan consortiums, this is the only one I know of where the extension service helps bring together both the educational and financial components,” Merolla said.

Demographics ultimately determine what programs to use, but this would be a good working example for other counties with similar issues, said Tom Olliff, public services administrator for Collier County.

Utilizing the educational expertise of UF/IFAS extension was only the start of new cooperation, he said. “The extension service has generally been thought of as a branch implementing traditional programs, but it really is an outreach of

Milt Putnam

UF’s resources and that entails a much broader menu than we had realized.

“Now we are trying to see how we can work with the extension service to meet more real life issues,” Olliff said.

It couldn’t be more real life for the Kellys, who moved in to their home just before Christmas. “It was very special for all of us,” said Mrs. Kelly, hugging one of her foster sons. “We’d love to live here forever.”

Bonnie Fauls, nfn07703@naples.net

Bob and Cyndi Kelly enjoy being owners of a home big enough to raise their own children and their foster kids.



Rebuilding a Community: One 4-H Garden at a Time

By Ami Neiberger

Thomas Wright



Assistant Dean for 4-H Damon Miller gives Marta-vis Godwin a hand with a potted plant.

How big is a tree when it begins? Not a tough question for the army of pint-sized gardeners waiting to tackle their latest project as they marched off the yellow school bus. The exuberant kindergartners and first-graders from the Joseph Little Nguzo Saba Charter School fell into formation and were ready to pick up their trowels and go to war.

The battleground is their own neighborhood – the Tamarind Park area in West Palm Beach. It’s a neighborhood overrun by crime, where drug dealers loiter on street corners and tempt children coming home from school.

The effort to rebuild the area is uniting the very young and the very old in a 4-H community gardening project.

“I like to dig,” said Camra Alexis, 6, as she dug a hole with Willie Saul, 5. They carefully checked the hole for buried treasure, just in case, before placing a bush inside. They were watched over by Francis Gibson Coffield, a retiree who is young at heart.

“It has an intergenerational component, allowing kids to spend time with an older generation and find common interests,” said Kim Coldicott, 4-H agent in Palm Beach County. “Kids don’t get the opportunity to do that often.”

Senior citizens will be paired with children to work on their plots together in the garden. Gardening is educational for kids, said Coldicott. “We believe that gardening is a hands-on way to teach kids about their connection to nature and science.”

Not to mention that it’s fun. “It’s important for children to play while they are learning,” said Damon Miller, assistant dean for 4-H youth development programs at the University of Florida’s Institute of Food and Agricultural Sciences. “Hands-on learning can really make education come alive for them. Of course, a little imagination helps, too.”

And gardening is good for seniors, too. “Working in the garden gives me strength,” said Coffield, a spry lady with plenty of get-up-and-go at 75. The garden will be named after her because she has devoted her life to caring for children in the community.

A few people might think retirement is a time for relaxing, but not Coffield. “I live a full life today. I think it’s important to teach children what the ground can do for them.” She’s not alone in her sentiment. Many of the adults involved in the project have lived in the community for more than 20 years and are working hard to revive it.

Thomas Wright



Martavis Godwin, Assistant Dean for 4-H Damon Miller, Lydia Fagan, Daeika Charles and Francis Gibson Coffield prepare to plant potted plants.

Bennie Herring grew up in the neighborhood and left a successful military career 11 years ago to become executive director of TRUTHS (Truth, Responsibility, Unity, Training, Hope and Success Inc.). The organization is working to revitalize the community. It recently co-sponsored the “Neighbor Helping Neighbor” project with more than 100 volunteers from Temple Israel. The neighbors helped fix up some of the houses belonging to elderly residents, cleaned up the neighborhood, and prepared the 4-H garden for further development.

Herring was on-site getting the youth excited about gardening. “People can do something for themselves if given the opportunity,” said Herring. After doing their planting for the day, he sent the grubby kindergartners home with plants, so they can watch them grow and talk about the project with their parents.

“It has an intergenerational component, allowing kids to spend time with an older generation and find common interests.”

Damon Miller



He says that many children never get out of the inner city to see nature, and the most rewarding thing about the 4-H project is seeing a child's face light up when a seedling comes out of the ground.

That will be reinforced with educational programs. There will be contests for the best vegetables and flowers. A butterfly garden and sitting area are planned. Coldicott says that the extension office will do a weekly educational program with the youth and seniors.

Ironically, the garden sits on land where a house was bulldozed after its tenants were evicted for drug activity and the land was taken by the city. It now belongs to Habitat for Humanity Palm Beach County, which is leasing the land to the group for \$1 a year. Habitat has committed to building 10 houses in the neighborhood as part of the revitalization effort.

Organizers say that community gardening does far more than teach children where food comes from, although that is important. Community gardens can restore a sense of civic pride and rebuild shattered community linkages, said Cara Jennings, Palm Beach County 4-H program assistant in community gardening.

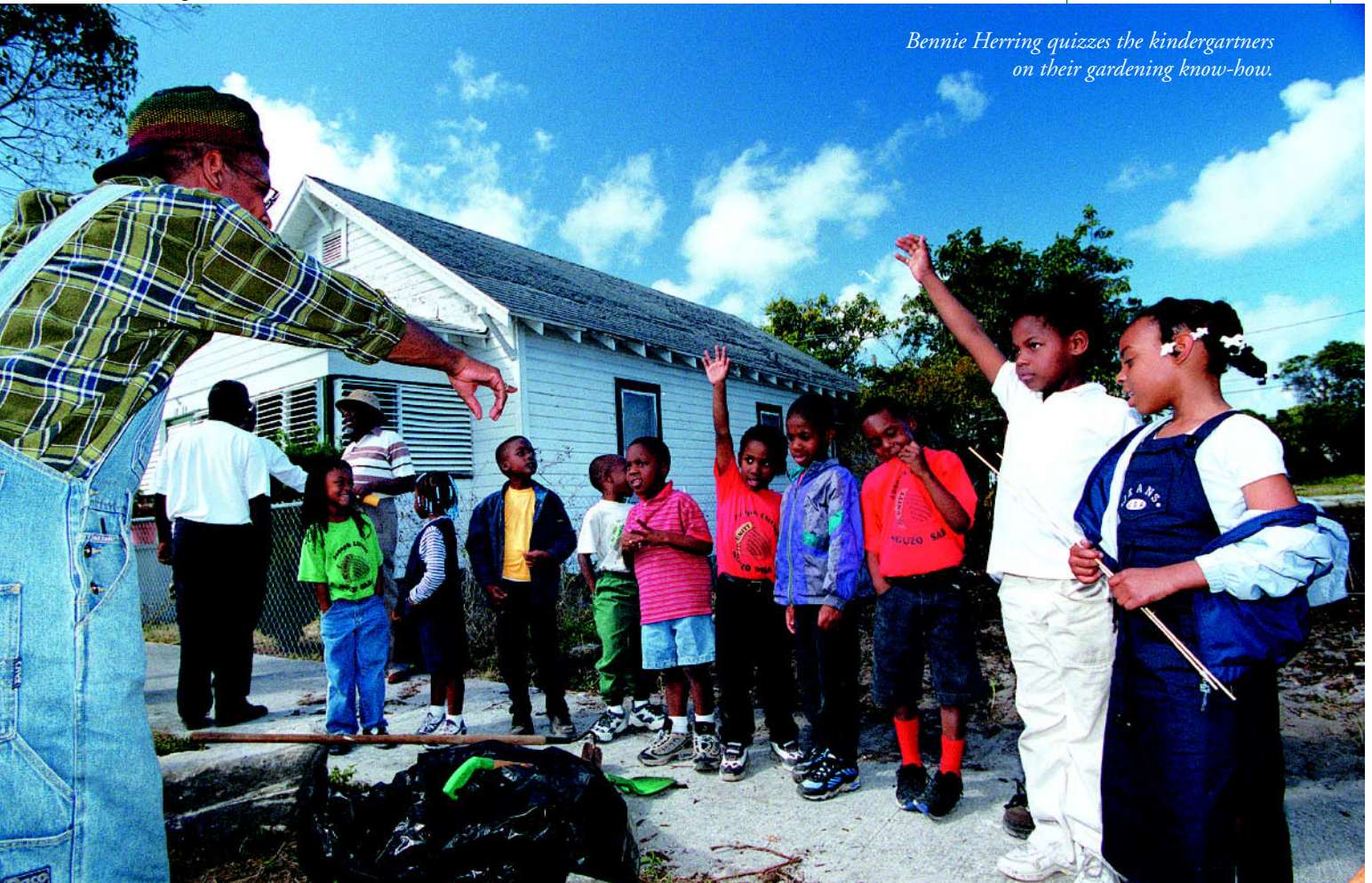
Residents have lived in fear of crime for so long that they are afraid to go outside sometimes, said B. Carleton Bryant, chair of the Black Citizens Coalition and a retired college professor who lives near the garden.

That attitude is changing thanks to community efforts, according to Bryant. "We will raise our voices and say we won't take any more of the crime and drugs. Not any more," said Bryant. "This project will enhance the community so people can get something out of it."

Will the retired professor be working in the garden with the kindergartners? He chuckled and said, "I was the child of migrant farm workers. I think I still have a green thumb or two left. I guess you do return to your roots."

Thomas Wright

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Bennie Herring quizzes the kindergartners on their gardening know-how.



Eric Zamora

Over 2,500 served a year

UF/IFAS food and nutrition program helps the Hispanic population eat better in Dade County

By Serya Yesilcay

Above, Program Coordinator Sandra Canales, left, takes time to go over nutrition issues with Hialeah resident Yoandra Rodriguez.

Leave the bag of chips and buy some carrots instead. And while you're at it, replace that soft drink with a gallon of milk.

Almost everyone knows how difficult it can be to change bad nutritional habits, but one educational program in Miami-Dade County is committed to helping people with limited incomes do just that: Turn bad habits into fresh starts and food stamps and vouchers into nutritional food items for better health.

By teaching the Hispanic population how to eat better and have higher nutritional standards, the program helps them lead healthier lives, said Sandra Canales, food and nutrition program coordinator at the University of Florida's Miami-Dade County Cooperative Extension Service.

"We target a lot of families with children, because we know they are the ones who will make the difference," she said. "We also work with pregnant women and teens to implement healthy eating habits from the start."

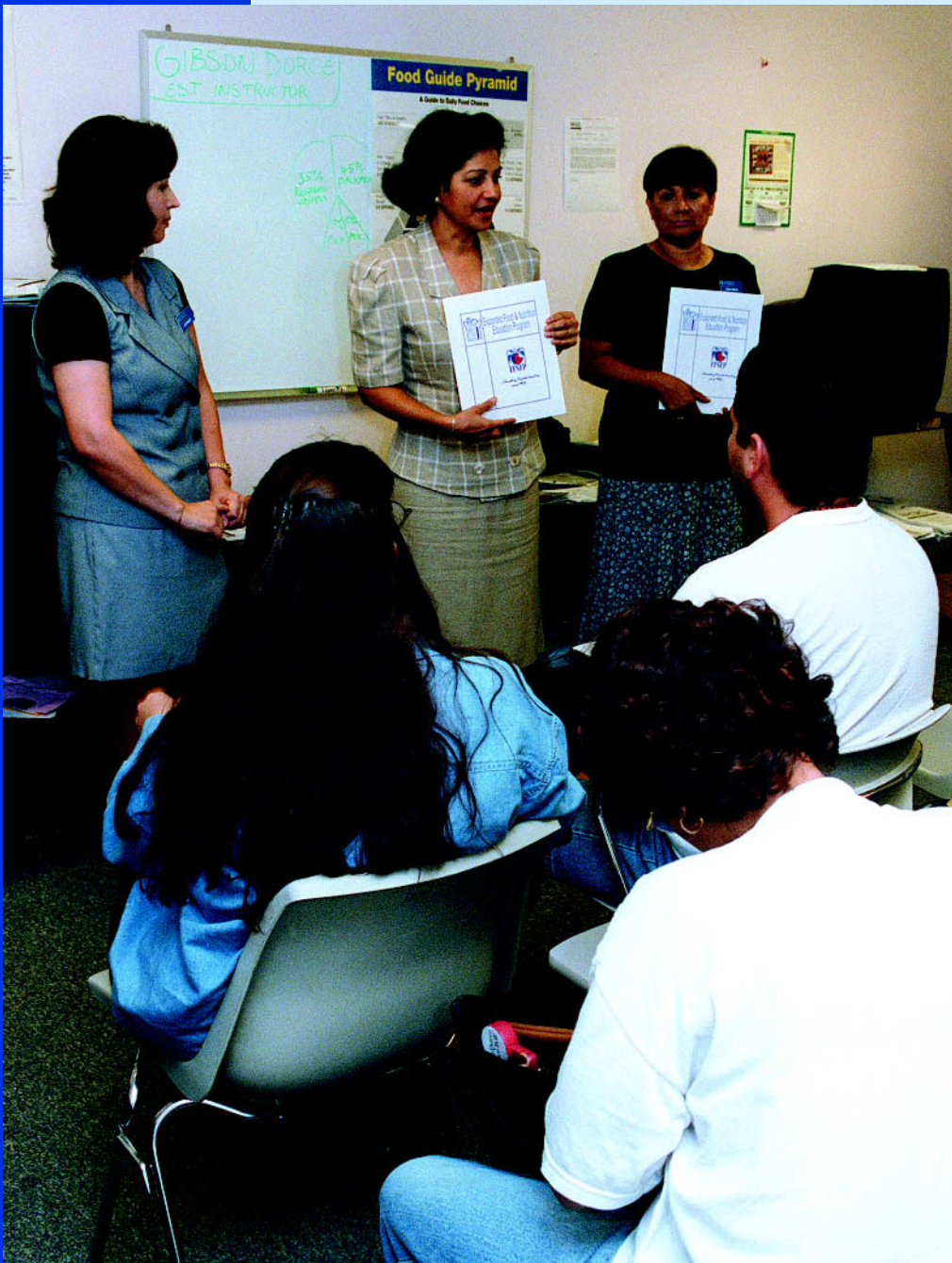
The program has really helped change food patterns and behaviors, said Linda Cook, coordinator of UF's Expanded Food and Nutrition Education Program.

"The Dade County Hispanic unit works with around 2,500 families a year to improve eating habits," she said.

And that means reaching another 8,000 or so family members through the participants.

Program assistants Luz Vasquez, left, and Sonia Garcia, join coordinator Sandra Canales, center, to discuss nutrition and better eating habits with their class.

Eric Zamora



The program has served many people since 1983, but it really isn't enough, Canales said.

"We really only reach a minimum number, because of resource limitations.

"We just do not have the manpower to do enough."

Nor do they get adequate funding to sustain this and other similar programs around Florida, Cook said. "The program is mostly federally funded with limited state and county funding.

"Federal dollars have not increased in the past ten years, and unfortunately there is more emphasis on special initiatives instead of continuing programs like this one," she said.

Ultimately, the families they help are the ones that lose the most through all the cuts, Canales said. A high percentage of them receive federal food assistance or other forms of aid, and the program has especially been effective in turning that assistance into good nutrition, she said.

"Our focus has been to complement other food assistance programs, which provide the physical help; but we give them the education to wisely spend that assistance."

Working with other agencies is an important component of the program and also helps them find potential clients, Canales said.

“We target agencies they already use, like Food Stamps, which provides the actual food dollars, and we can tell them what to buy to have a balanced meal; or Women, Infants and Children, which gives vouchers, and we inform clients about proper nutrition.”

They also go to clinics where people receive other services, Canales said. “Then they can also learn about better nutrition and what to eat to be more healthy.”

Since 53 percent of the population is Hispanic, teaching very often becomes bilingual, Canales said. “Our books, materials are all bilingual, and even if there is one non-Spanish speaker in a class, we go over everything in two languages.”

Clients need to complete a 10-to-12-lesson course on food and nutrition, usually over several months, taught by UF/IFAS extension agents and volunteers.

They then earn certificates which many even use during job searches, Canales said.

“These are low-income people, with maybe a sixth grade education at most, and for many of them, a certificate from a university is very important.

“So they take the program very seriously.”

Cook agreed. “It is interesting to go back to some homes of clients after a year and see the certificates hanging on their walls.



Sandra Canales speaks to a nutrition class.

“We target a lot of families with children, because we know they are the ones who will make the difference.”

Sandra Canales

“For many, these are the only certificates they have ever gotten, and we hear success stories of how they have found jobs as a result.

“They just really improve their lives and sense of well-being overall,” she said.

But it will become even more difficult to sustain programs when federal partners have not indicated any hope for future funding, Canales said, and they will probably have to keep cutting manpower and resources to continue their programs.

“If this were a one time deal, we could have reached more people, but with a series of programs we really target a much more in-depth kind of learning,” she said.

In depth and personal – if students miss a class, instructors will either go to their homes or stay after class to repeat the lessons, Canales said.

All that effort takes time and money, but Canales does not lose hope.

“One of our agents who has been around for 29 years would always say how scared they were every year that funding would be cut.

“But now she is retiring, and laughs it off, saying, ‘If it has been around this long, you don’t have to worry any more.’

“I hope she’s right!”

Sandra Canales, scv@gnv.ifas.ufl.edu
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Environmental educators will get better opportunities to address Florida's issues through UF/IFAS program

The next time you attend a workshop on Florida's environment, you might be able to learn from a real master—a Florida Master Naturalist, to be exact.

Ecotourism operators and wildlife managers alike have expressed needs for more structured education, leading to the creation of the Florida Master Naturalist Program, spearheaded by a University of Florida researcher.

"One of the reasons I wanted to do this program was to learn more myself," said Martin Main, wildlife ecologist with UF's Institute of Food and Agricultural Sciences. But the main incentive was the lack of qualified people to present accurate information, he said.

Until now. The Florida Master Naturalist Program being developed by Main and professionals at other environmental institutions, will help train qualified environmental instructors.

"By training environmental education professionals as Florida Master Naturalist Program instructors, we can

reach a much larger audience and maximize returns from our investment in this program," Main said.

Educating people to make the most of Florida is crucial, especially now, when the threats to conservation are so big. Urbanization and tourism have both affected Florida's natural habitat, he said.

"Even ecotourism, with a 30 percent growth per year, can become a threat to the environment," Main said. "For example, disturbing colonies of nesting wading birds or eagle nests would not be practices we want ecotour operators to engage in, even if unintentionally."

To prevent such practices, master naturalists would train in environmental ethics as well, he said.

Although there are some small groups that do very well at training their employees, guides and volunteers, most of existing environmental training depends on the work of one person, Main said. That can be difficult to sustain, when most attempts "bring in a



Milt Putnam

disconnected series of speakers -- on bats one year, on butterflies another," he said.

"By developing program materials and format, training efforts will be fairly consistent among instructors, which is important from a potential employer's perspective," Main said. "This way, instructors can follow a guided path while adding their own expertise as well."

That path will include teaching about Florida's freshwater, upland and coastal ecosystems to employees, volunteers, ecotour operators, and other interested persons. Three different teaching modules will have 40 contact-hours each, including 16 classroom hours, 18 hours in the field, and a six-hour supervised practicum where students will have supervised practice presenting information to tour groups.

Martin said the program's evolution was helped by a collaborative funding effort: a recent \$91,190 grant from the Florida Advisory Council in Environ-

Martin Main stresses the importance of educating people to make the most of Florida, especially when urbanization and tourism are rapidly becoming threats to its environment.



Milt Putnam



Wildlife ecologist Martin Main envisions the Master Naturalist program as a way to protect Florida's environment through intensive education for ecotourism professionals.

mental Education; \$12,000 from The Southwest Florida Council on Environment Education Inc., along with a UF Extension Enhancement Award for another \$4,000.

The first training session is planned for early 2001, following the development of the wetlands module. But interest is already high, Main said. "We have a big group of people who are willing to teach and others chomping at the bit to start the program. People want to be able to say 'I've taken the necessary training, and it comes from UF.'"

Other cooperators include Florida Gulf Coast University, professional ecotourism operators, and the National Audubon Society Corkscrew Swamp Sanctuary.

For more information, visit www.masternaturalist.com or contact Martin Main at (941) 658-3400 at the Southwest Florida Research and Education Center in Immokalee.

Martin Main, mbma@icon.imok.ufl.edu

—Serya Yesilcay

New educational program to target natural resource issues in South Florida

The Florida Earth Project is almost ready for take-off, and participants can look forward to exploring South Florida's major natural resource issues on location.

With an outdoor setting to experience real-life conservation issues, participants will get to apply theoretical knowledge or learn more on topics out of their areas of expertise, said Stan Bronson, an extension agent for the University of Florida's Institute of Food and Agricultural Sciences, who also works on agricultural and natural resources policy. "We want to turn the Everglades into a classroom laboratory."

Along with the Everglades to provide a perfect setting, Florida universities, government agencies, private industry and non-governmental institutions have agreed to offer their expertise.

"The Earth Project will provide a hands-on chance for learning on agriculture, politics and environment in the Everglades area—from water management policies to a chance to see firsthand what farmers are doing to work in the Everglades area and enhance its conservation," said Mitch Flinchum, District 5 coordinator for the UF/IFAS Extension Service.

The project will be open to university students, professionals from government agencies and private industry. Teaching will include guest lectures, seminars and field experience through six separate teaching modules to allow instructors to give a comprehensive view on different issues, Bronson said.

Although the whole course will take three to four weeks to complete, participants also will be able to take the modules separately. This will help address the needs of both extension education and academia, he said. "You can look at it both as a university component and for professionals, to educate the partners themselves."

Taken as a whole, the modules will

cover all aspects of South Florida's natural resources environment, Bronson said. Topics of study will cover a survey of the region, its agriculture, the South Florida Water Management District, natural systems, development and restoration.

Although South Florida is of primary concern, Bronson said the topics relate to other geographic areas and could thus attract students from diverse backgrounds. "Florida students from natural resources, agriculture or environmental engineering can apply," he said, "but we want the program to be transferable. Someone from Duke should be able to come, or someone from a South American university—they can see things that those countries will be dealing with 20 to 30 years from now."

In Florida, the project already has brought together more than 30 partners, including UF's Center for Natural Resources, the South Florida Water Management District, non-governmental organizations including the National Audubon Society, agricultural companies and other private industry. "Interest in the project was very high from the start," Bronson said. Classes will start in July, just a year after the initial idea originated.

Applications will be accepted starting in April. For more information, check <http://earthproject.ifas.ufl.edu> or contact Bronson at (561) 233-1724.

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—Serya Yesilcay



Silicon gets the respect it deserves

When it comes to plant nutrients, silicon is finally getting the respect it deserves, thanks to a group of University of Florida scientists whose breakthrough research has demonstrated the importance of this element in world agriculture.

“Until now, this element has always befuddled people because plant nutritionists have never considered it essential,” said Lawrence Datnoff, professor of plant pathology with the UF’s Institute of Food and Agricultural Sciences (UF/IFAS).

He said new findings by a group of scientists at the Everglades Research and Education Center (REC) in Belle Glade show this element can boost crop yields, reduce the need for expensive fungicides and improve plant resistance to some diseases. Datnoff said silicon has been used successfully in Florida on rice and sugarcane for many years and has been reported to improve production on other crops ranging from citrus and strawberries to tomatoes and cucurbits.

“For me, as a plant pathologist, to see what silicon does for disease control is just phenomenal,” he said. “It doesn’t just control one disease, it controls several diseases. You can better manage your fungicide applications, reduce the number of applications or maybe eliminate them altogether.”

Datnoff and other researchers at the Everglades REC have demonstrated that the residual effects of this element one year later provide effective disease control comparable to the application of fungicides.

“We also found this element could enhance control of the two most important rice diseases in the world—blast (*Magnaporthea grisea*) and sheath blight (*Thanatephorus cucumeris*),” he said. “In the case of rice cultivars that are partially resistant to these diseases, the use of silicon makes them almost completely resistant.”

Other faculty at the Everglades REC working with Datnoff are George Snyder, distinguished professor of soil science; Jose Alvarez, professor of agricultural economics; and Christopher Deren, professor of agronomy/breeding. Thomas Kucharrek, professor of plant pathology at UF in Gainesville, is also working with the

research group. The UF group, which recently won the prestigious UF/IFAS Interdisciplinary Research Award, is currently engaged in collaborative work with soil scientists and plant pathologists from Brazil, Colombia, India and Russia.

Out of the UF group effort has come a calibrated soil test for silicon, now one of the most requested tests conducted by the Everglades REC. A rapid method for assessing the silicon content of plant tissue also has been developed, and it is now being used by a number of private laboratories.

Datnoff said the UF research group revealed that silicon has great potential for being incorporated into an integrated pest management program for managing diseases such as blast. The group also demonstrated that yields may be increased without further genetic improvements. These yield increases are associated with silicon increasing grain set (sexual fertility) more than any other biomass component.

“We have found that silicon can benefit plant growth through greater yields in rice while improving the sugar content in sugarcane,” Datnoff said. “Silicon can be very useful, especially when these plants are under stress. Silicon may enhance soil fertility, improve soil physical properties, improve disease and pest resistance, increase photosynthesis, regulate evapotranspiration, increase tolerance to toxic elements such as aluminum and manganese and reduce frost damage.”

Because of UF research, many institutions in the United States (University of Arkansas, University of Georgia, Louisiana State University, North Carolina State University, Rutgers University) and other countries (Australia, Brazil, Colombia, Philippines, South Africa, Thailand, Venezuela, Vietnam) are now implementing this approach or studying its feasibility in rice and other crops, including fescue, rye, sugarcane and wheat. Consequently, this UF research has not only helped local and national rice growers, but has helped rice and other types of growers around the world.

The UF researchers summarized the per-hectare benefits (gross revenues) of using silicon minus costs from increased



Milt Putnam

Lawrence Datnoff, plant pathologist at the Everglades Research and Education Center in Belle Glade, examines rice plants in a greenhouse.

rice yields, controlling blast and other diseases, potential grain discoloration, insect management, reduced phosphorus applications and liming costs. Total extra net returns from the silicon application, using the yield-cost-price structure assumed for South Florida, amounts to a total of \$349.39 per hectare. This figure encompasses a comprehensive – although conservative – total benefit that resulted from silicon research conducted in different ecosystems in Florida, Colombia and other parts of the world.

These and other research findings were discussed by 90 scientists and industry personnel from around the world at the Silicon in Agriculture Conference in September 1999 in Fort Lauderdale. The program included speakers from Australia, Brazil, Canada, Colombia, Japan, Korea, Netherlands, New Zealand, Russia, South Africa and the United States.

The conference was organized by Datnoff, Snyder and Gaspar Korndorfer, professor of soil science at the Universidade Federal de Uberlandia in Brazil. Sponsors included the UF and U.S. Department of Agriculture.

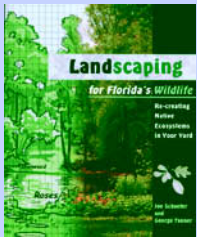
Lawrence Datnoff, leda@gnv.ifas.ufl.edu

—Chuck Woods

New educational resources from the IFAS/Extension Bookstore

Landscaping for Florida's Wildlife Video Series

UF/IFAS Communication Services with UF Department of Wildlife Ecology and Conservation



Joe Schaefer, co-author of *Landscaping for Florida's Wildlife*, designed this new video trilogy, "Providing Food," "Providing Water" and "Providing Cover," as a companion piece to his popular publication on backyard ecosystems.

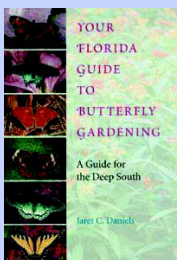
With the same simple step-by-step format of the book, these videos illustrate in living color the methods for providing food, water and shelter to wildlife encountered in backyards throughout Florida. These videos are available individually or as a set, and can be used as supplements to extension programs or enjoyed independently by the Florida homeowner.

Available April 2000.

Your Florida Guide to Butterfly Gardening: A Guide for the Deep South

Jaret C. Daniels, Ph.D.

Co-published by UF/IFAS Communication Services and University Press of Florida



The book, the third in the popular *Your Florida Guide* series, offers a thorough look at Florida's most important butterflies and the plants they prefer for food, shelter and egg laying.

The guide helps you select plants for a yard where butterflies can live and return year after year. It includes planting diagrams, easy one-day container projects and full garden layouts designed for each of Florida's three major growing zones, as well as designs suitable for the Deep South.

Author Jaret Daniels, an avid lepidopterist, persuaded his household to allow their garage to become a butterfly farm and raised many of the creatures pictured in the book. The full-color photographs, all taken by him, show butterflies, the caterpillars from which they develop, nectar plants, host plants and garden designs. Of special interest is a section on conservation that describes how individuals can act locally to improve the quality and biodiversity of their environment.

Daniels is the former manager of Boender Endangered Species Laboratory at the University of Florida, Gainesville. He has written extensively on butterflies and other beneficial insects in such publications as *Fine Gardening*, *American Butterflies*, and *Tropical Lepidoptera*. For the past nine years he has worked on the ecology and conservation of several endangered and threatened butterfly species in Florida and the Caribbean, including the Schaus swallowtail. Daniels is currently the curator of lepidoptera for Butterfly Kingdom Conservatory in Hilton Head, S.C.

Available June 2000.

Your Florida Guide to Butterfly Gardening Video

UF/IFAS Communication Services

This instructional video was designed as a companion piece to the *Your Florida Guide to Butterfly Gardening* book.

Butterfly expert Jaret Daniels will teach you how to create your own butterfly paradise. You'll be treated to a sampling of exquisite butterfly gardens from all over Florida, learn about the butterfly life cycle, and see the step-by-step process that will turn your landscape into a haven for butterflies.

This video is perfect for use in extension and classroom programming as well as by the individual butterfly enthusiast.

Available June 2000.

The Butterfly Gardening ID Decks

UF/IFAS Communication Services with UF Department of Entomology and Nematology

Can you tell a Tiger swallowtail male from a dark-form female? Can you tell a Banded hairstreak from a Great purple hairstreak? From the photographic collection of butterfly expert Jaret Daniels comes the ultimate, pocket-sized butterfly reference.

Over 50 species of butterflies and caterpillars spring to larger-than-life in this splendid, full-color identification deck, perfect for use in the garden, in the field, or in the classroom. Use it to inspire the minds of future entomologists, or enjoy privately in your backyard butterfly garden.

Available April 2000.

Educational Resource Information

Educational resources produced by IFAS, including those co-published with University Press of Florida, are available from the IFAS/Extension Bookstore (formerly IFAS Publications) located in Building 440, Mowry Road, on the University of Florida campus. To access the UF/IFAS catalog of educational resources and order form, visit the IFAS Communication Services website at <http://ics.ifas.ufl.edu/ForSaleResources>. Please call 1-800-226-1764 to place VISA and MasterCard orders; or fax orders to 352-392-2628.

IFAS Communication Services is looking for Florida Cooperative Extension Service offices interested in representing the IFAS Extension Bookstore, formerly IFAS Publications, at trade shows and professional meetings for the purpose of selling educational resources produced by the Institute of Food and Agricultural Sciences at UF. Discounts off the retail price for bulk purchases are now available. Please contact Eva Squires, Marketing/For-Sales Coordinator, at 352-392-2411, or email esquires@gnv.ifas.ufl.edu.



Eric Zamora

At the Fort Lauderdale Research and Education Center, Professor John Cisar, right, and research assistant Karen Williams open a pipe underneath an elevated turf plot to examine water that has drained through the soil. The Elevated Florida Yard is raised so that Cisar can measure how nitrogen filters through layers of soil. The experiment allows him to compare chemical losses from a traditional lawn landscape with those from a mixed species ornamental landscape. The research will help fine-tune recommendations for applying chemicals to Florida landscapes.

All programs and related activities sponsored for, or assisted by, the Institute of Food and Agricultural Sciences are open to all persons regardless of race, color, age, sex, handicap or national origin. Information from this publication is available in alternate formats. Contact the Educational Media and Services Unit, University of Florida, P.O. Box 110810, Gainesville, FL 32611-0810.