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IMPACT[®]

The University of Florida Institute of Food and Agricultural Sciences



UNIVERSITY OF
FLORIDA

Institute of Food and Agricultural Sciences

**North Florida Focus:
putting FloridaFIRST**

Perspective

By Michael V. Martin

At the start of the new millennium, the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) is on the move!



Mike Martin

Vice President for Agriculture
and Natural Resources

Florida FIRST: Over the past two years, UF/IFAS has worked to implement the major tenets of our Florida FIRST (Focusing IFAS Resources on Solutions for Tomorrow) strategic planning effort. We have allocated positions and support, restructured to reduce administrative costs, developed an institutional marketing plan, launched a special initiative on the economic importance of the sectors we serve, and aggressively pursued diversity in our faculty and staff.

Florida FIRST has allowed us to change the nature of the on-going dialogue with the people we serve. Specifically, we are placing more emphasis on program outputs or impacts — rather than inputs and resource allocations. Or, stated differently, we're communicating what we do and its importance in terms that are understandable to those we serve. We will hold a second statewide Florida FIRST Conference, June 27-29 in Orlando, to make "mid-course" corrections in the program.

Public Profile: Thanks to Florida FIRST and other initiatives, we are successful in raising public awareness about what UF/IFAS does, the impacts we have, and the importance of our programs to the state and its citizens. Given Florida's rapid population growth and demographic change, it is important that we continue our efforts to build awareness statewide.

Partnerships: We have redoubled our efforts to establish productive partnerships with other State University System (SUS) institutions, community colleges, state agencies and private organizations. The new Lake Okeechobee Restoration Project is a fine example of interagency collaboration. We're working closely with Florida Department of Agriculture and Consumer Services, the Florida Department of Environmental Protection and the South Florida Water Management District on the lake restoration effort. In this issue of IMPACT, the story on the Suwannee River Partnership is another prime example of our effort to develop strong working relationships.

Our College of Agricultural and Life Sciences is developing new statewide partnership teaching programs at Homestead and Apopka as well as in Hillsborough County and surrounding areas. We are discussing areas of collaboration with Nova Southeastern University in Fort Lauderdale, and we are working to expand regional research and extension program cooperation with selected universities in the U.S. Southeast.

International Cooperation: The UF/IFAS Office of International Programs has led the way in establishing opportunities for our faculty to acquire new experience and make global connections. International cooperative agreements have been signed. Our International Programs Action Team has provided insightful guidance as we seek to more fully integrate an international perspective in all we do.

Special Initiatives: Work continues on assessing the impacts of the various sector industries we serve in the state's economy. This analysis, which will form the foundation of a public education program, will help inform the Florida Legislature about the significance of UF/IFAS teaching, research and extension activities. We also are completing a dynamic database, which describes work that UF/IFAS does in all 67 Florida counties. We intend to use this information to ensure that policy makers fully appreciate our statewide mission and our sizeable, positive impacts in every legislative and congressional district.

Challenges and Opportunities: Every great institution is committed to becoming even stronger, and so it is with UF/IFAS. The future offers a tremendous opportunity to enhance our service to the citizens of Florida. UF/IFAS is blessed with talented and dedicated faculty and staff. The faculty is at the center of all we do — and all we contribute as a land-grant institution. Faculty achievements include another year of outstanding service and national recognition. We also are proud of our excellent and committed support staff. They enhance, enable and extend the programs of our faculty.

UF/IFAS is up to the task of building excellent programs, and the people of Florida can confidently count on us to meet the needs and expectations of our unique land-grant mission.

A handwritten signature in black ink that reads "Michael V. Martin". The signature is written in a cursive, flowing style.

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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: floridafirst.ufl.edu

On the cover:

George Hochmuth, left, and his brother, Bob, examine marigolds being grown hydroponically — without soil — at UF's North Florida Research and Education Center — Suwannee Valley in Live Oak. George is director of the center and Bob is a multi-county extension agent based in Live Oak. (Photo by Eric Zamora)



Institute of Food and Agricultural Sciences

IMPACT[®]

Volume 17, No. 1

Winter 2001

High-Tech Hydroponics

4 Technology and marketing expertise from UF's North Florida Research and Education Center — Suwannee Valley boost hydroponic farming.

50th Anniversary

9 UF's North Florida Research and Education Center — Suwannee Valley celebrates its first 50 years of service to producers and consumers.

Nicer Neighbors

13 Dairy farms and other large animal farms can reduce odors with a new UF waste management system.

Water Quality

16 UF research and education programs are helping reduce nitrate levels in the Middle Suwannee River Basin.

4-H Volunteers

26 More than 13,000 volunteer 4-H leaders are key to the statewide youth development program's continuing success.

Essential Vitamins

31 While everyone needs adequate amounts of folate, the vitamin is important for senior citizens, according to new UF research.

Free Guides

New Farm Market Guides help consumers locate and purchase fresh produce direct from growers. **8**

Potato Progress

UF's Hastings Research and Education Center is helping northeast Florida potato growers stay competitive in changing markets and diversify their production. **10**

Mole Cricket Control

A nematode imported by UF researchers from South America provides effective control of the mole cricket, one of the most troublesome pests. **14**

Number One

The Florida Sea Grant College Program, based at UF, receives top national ranking. **22**

Statewide Service

Ten new monitoring stations will allow the Florida Automated Weather Network to provide statewide coverage. **28**

Hydroponic Farming Opens New Markets for Specialty Crops

By Tom Nordlie



Background photo: Vertically-stacked styrofoam pots grow lettuce, leafy greens edible flowers and herbs in a hydroponic greenhouse at UF's North Florida Research and Education Center — Suwannee Valley in Live Oak (Photo by Audrey Wynne)

Inset photo: Michelle Schenk, left, who grows hydroponic strawberries in Bronson, and Anthony Drew check plants for spider mites. (Photo by Eric Zamora)



Denise Francis, left, and Mike Sweat admire a strawberry grown using outdoor hydroponics. Strawberry plants in the background are covered to protect them from winter cold.

Once considered a curious hobby for home gardeners, soilless or “hydroponic” farming now is big business in North Florida, thanks largely to research and education programs at UF’s Institute of Food and Agricultural Sciences.

Statewide, Florida had 84 acres in hydroponic production during 2000, yielding a crop of tomatoes, cucumbers, herbs, lettuce, peppers and strawberries worth \$16.8 million, said Bob Hochmuth, a multi-county extension agent based at UF’s North Florida Research and Education Center — Suwannee Valley near Live Oak.

“North Florida has many small hydroponic farms,” Hochmuth said. “More than half of all the hydroponic growers in the state are located here, but our production is only about 10 to 15 percent of the state’s total. This is because there are fewer, but larger, greenhouse operations in South Florida. But, we expect continued growth during the next few years. Demand for greenhouse-grown produce is increasing and the industry is changing. Our job is to help farmers stay competitive.”

Staying competitive means using new technologies and marketing strategies, Hochmuth said. Hydroponic farmers

throughout Florida and the Southeast look to UF for that expertise.

“In fact, the current state of art was virtually defined by UF/IFAS,” he said “Very few land-grant universities have our level of commitment to hydroponics. Our programs are highly visible for that reason.”

Hochmuth and his brother, George, director of the North Florida Research and Education Center, have edited a three-part production guide on hydroponic vegetable production. The guide and other greenhouse vegetable publications are available from UF extension.

In Florida, the current hydroponic growing medium of choice is perlite, a crushed, lightweight volcanic rock that the Hochmuth brothers helped popularize. To accomplish feeding and watering in one step, hydroponic crops are irrigated with precise nutrient solutions. Most hydroponic crops are raised in greenhouses where all growing conditions — temperature, irrigation, fertilization, pest control — can be managed more efficiently than in outdoor fields.

“Because reduced pesticide use continues to be an important issue, we are developing pest control methods that are more compatible with the environment,” he said. “For



example, we designed a ventilation system for tomatoes that keeps plants dry and prevents fungal diseases such as botrytis. We also helped identify a new tomato virus that's transmitted by whiteflies, and developed screening practices to keep whiteflies out of greenhouses."

While indoor hydroponic production has its advantages, outdoor production can be successful, too. One change that may actually promote the use of hydroponic farming in open fields is the Environmental Protection Agency's decision to ban use of methyl bromide soil fumigants in 2005. Without this chemical, crops grown in soil may be damaged by nematodes and other soil-borne pests. Hochmuth said tests at the Live Oak center indicate outdoor hydroponic production could minimize soil-borne pest problems.

"It's too early to predict how significant outdoor hydroponics may become," Hochmuth said. "But we do believe that it has merit for some specialized crops such as herbs, leafy greens, lettuce and strawberries. Some producers have already had good results with outdoor hydroponic production. So it's not a pie-in-the-sky thing."

Marketing Opportunities

"For more than a decade, our research and extension programs have solved various production problems associated with hydroponics," said Dan Cantliffe, chairman of UF's Department of Horticultural Sciences. "The result has been an impressive array of crops ranging from lettuce and tomatoes to strawberries and cut flowers. Now, we're focusing more attention on the marketing aspects of the industry here in North Florida, helping farmers to become more successful in today's increasingly competitive domestic and international markets."

He said specialized or "niche" marketing now is essential for hydroponic farmers. By taking advantage of changing consumer preferences and offering unique or premium-quality items, growers can reach lucrative markets such as health-conscious consumers.

Niche marketing also has stimulated interest in new crop varieties, Cantliffe said. At UF's Horticulture Research Unit in Gainesville, Cantliffe grows hydroponic items that may be tomorrow's supermarket staples, like a seedless, high-yield cucumber developed in Israel and the Galia muskmelon, Europe's best-selling melon variety.

"What you sell is just as important as how you sell," Cantliffe said. "Interesting new products like edible flowers, exotic herbs and specialty greens can command higher prices."

He said the need for high crop prices is a constant factor in hydroponic farming because the technology is expensive. Major investments for growers include greenhouses and equipment for heating and cooling, ventilation, irrigation and fertilization. Larger farms use computer-controlled automation to accomplish some tasks. Start-up costs for a hydroponic farm average \$4 to \$8 per square foot of production.

"The trade-off is that with hydroponics you may have sustained crop yield eight months out of the year," Cantliffe said. "You also can fit more plants into less space. One acre of a high-value crop grown outdoors may gross \$20,000 to \$30,000 per



George Hochmuth checks lettuce varieties grown hydroponically at UF's North Florida Research and Education Center — Suwannee Valley.

Eric Zamora

year, whereas one acre of the crop grown hydroponically may gross \$200,000 to \$250,000.”

Because many small hydroponic growers in North Florida operate on a part-time basis, they rely on UF extension as their primary source of advice. For example, Michelle Schenk, who operates the only commercial hydroponic farm in Levy County, said extension agent Anthony Drew helped her solve a common problem in greenhouse strawberry production.

“I had just started growing strawberries and didn’t have any experience with pest control,” Schenk said. “Something was making the leaves shrivel up and covering them with webbing, but I couldn’t find the cause. Anthony took samples of the leaves, contacted UF and got me an answer within an hour — microscopic spider mites. Without his help I might not have had any strawberries to market.”

When it comes to marketing North Florida’s hydroponic crops, no one is more involved than Suzanne Stapleton, a multi-county extension agent based at the Live Oak center. She believes knowledge is the key to success.

“We emphasize three points for farmers,” the marketing agent said. “You must keep track of market prices, know your production costs and know the demand for your product. The Live Oak center provides marketing education for farmers, and we work to develop new marketing opportunities.”

Stapleton said networking can develop new and stronger markets, particularly if potential buyers and sellers are unaware of each other. To promote that awareness, she and Tom McGinty, executive chef with the Florida Department of Agriculture and Consumer Services, recently held a workshop at the Live Oak center for two dozen local produce farmers and chefs from Tallahassee, Jacksonville, St. Augustine and Gainesville.

“Everyone was very enthusiastic,” Stapleton said. “The chefs are looking for high-quality fresh items, and many of the farmers produce specialty crops that may not be available from grocery stores or produce brokers. We’re planning a similar event for spring 2001.”

In another marketing effort, Stapleton is working on a UF strawberry project headed by Bradford County Extension Director David Dinkins in Starke. She developed promotional materials to help producers take advantage of new marketing windows. Both hydroponic and soil-grown berries were produced in late fall when no other Florida producers were harvesting fruit.

To sell the berries, Stapleton is working with Denise Francis, a Macclenny-based herb farmer with experience in marketing specialized crops to upscale restaurants in Jacksonville.

“Denise has the right contacts and the know-how for this job,” Stapleton said. “Before she started farming, she worked in the restaurant industry — she understands exactly what these customers need.”

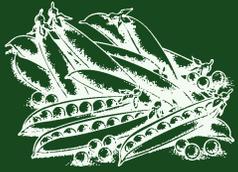
Baker County Extension Director Mike Sweat, Macclenny, said cooperation between UF and successful hydroponic farmers is a “win-win” situation that will become more important in the future.

“We’re just beginning to realize of the potential of hydroponic farming,” Sweat said. “While we continue to provide technical and marketing knowledge the industry needs, farmers are helping us recognize which areas need our attention. We’re working together like a pilot and a navigator.”

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Fresh From the Farm

A new farm market guide, available from the UF Extension Service, helps consumers locate and purchase fresh produce from local growers in North Central Florida.



Eric Zamora

Grower John Steyer, left, and Suzanne Stapleton look at a display of turnip greens at the farmers' market in Alachua

and cane syrup. With the guides, consumers will be able to find U-pick opportunities, convenient retail farmers' markets and even farms that deliver produce.

"As North Florida's population increases, there are growing opportunities to market products locally," Stapleton said. "The guides will enhance business opportunities for area farmers. The result is a win-win situation for all involved: Consumers can easily locate sources for local agricultural products and farmers can more easily sell their products direct and fresh."

There are about 5,500 farms in the area, and more than 90 percent of these are small farms, often operated as a family business, Stapleton said.

Eddy Hillhouse, president of the Economic Alliance of Suwannee County in Live Oak, said agriculture is an important part of the environment and economy in the region. "The easiest way to keep our area natural and rural is to keep the farmers in business so they continue to use and care for the land."

He said farms contribute significantly to local economies, providing jobs and purchasing services from related businesses in irrigation, sales, packaging and transportation.

Paulette Lord, manager of the Tourist Information Center in Lake City, expressed enthusiasm for the new guides, adding that many visitors are requesting and using the publications.

Sharon Yaego, manager of the Alachua County Farm Market in Gainesville, said consumer demand for the guides — already strong — will increase in the spring when more products are available.

Tanya Terry, a farmer in Madison, said she expects more calls as a result of the guide, especially when her strawberry crop is ready for harvest. Brad Lingo, a farmer in Bronson, said maps in the guides will benefit all farmers in the area.

The guides are available free of charge from UF extension offices in Alachua, Baker, Bradford, Clay, Columbia, Dixie, Duval, Gilchrist, Hamilton, Lafayette, Levy, Madison, Nassau, St. Johns, Suwannee, Taylor and Union counties.

Stapleton said copies may be available at local chambers of commerce, city halls and libraries. The guide also is available on the Internet. http://nfrec-sv.ifas.ufl.edu/farm_mkt_guide.htm — Chuck Woods

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Buying fresh produce direct from local farmers is easier than ever thanks to a new *Farm Market Guide to North Central Florida* published by the UF's Institute of Food and Agricultural Sciences.

Two versions are available, one for farms east of Interstate 75 and another for those west of I-75.

"The directories include farms and markets in 17 counties that sell home-grown agricultural products to the public," said Suzanne Stapleton, multi-county extension marketing agent at UF's North Florida Research and Education Center — Suwannee Valley in Live Oak. "With a map showing each farm's location and a list of products available, the retail farm guides are convenient to use. The folded guides can be carried in your car, pocket or purse."

Many of the farms listed offer discounts for new customers. By showing the guide to farmers, consumers may be entitled to a 10 percent discount, she said.

Stapleton, who developed the guides for the UF Extension Service, said they were produced in cooperation with five co-sponsors: Florida Department of Agriculture and Consumer Services, Florida Farm Bureau, Council for Progress of Suwannee County and the Columbia and Madison county chambers of commerce.

The guides list sources for fruits, vegetables, hay and livestock, as well as other farm products such as honey, eggs

50th Anniversary Celebration



Eric Zamora

Fifty years of service to producers and consumers in the Suwannee Valley area were recognized in October 2000 during the 50th anniversary celebration at UF's North Florida Research and Education Center — Suwannee Valley in Live Oak.

“More than 1,200 people attended the celebration, and there was something for everyone,” said George Hochmuth, center director. “The program, which was open to the public, featured a wide range of events designed for growers and families, including tours and fun events such as a hay ride, pumpkin picking and decorating and a barbecue.”

Hochmuth said grower tours highlighted field vegetable and fruit crop trials, greenhouse and outdoor hydroponics and forestry production. Field vegetable and crop trials included specialty crops, collard varieties, fruit crops, early season strawberry production, paper mulches, nitrate management and water quality updates.

Hydroponic production (greenhouse, open air, shade structure, bag culture, floating system and vertical systems) was demonstrated for cucumbers, cut flowers, herbs, peppers and specialty crops. Results of forestry research trials, including information on fertility management, pine species, pine straw management and weed control, also were presented.

Hochmuth said the center, part of UF's Institute of Food and Agricultural Sciences, has many programs to meet the needs of the Suwannee Valley region. There are programs on profitable alternative crops, small farms, greenhouse and hydroponic production, fruits and nuts, plasticulture, drip irrigation, nutrient management, water quality and manure management.

“Our new research and education programs give greater emphasis to marketing, post harvest and forestry,” he said. “In addition to serving commercial producers in the region, the center has popular educational programs in master gardener training and 4-H youth development.”

Hochmuth said the center is one of 13 regional research and education facilities “located in major agro-ecological niches of Florida.” The center's mission is to develop appropriate technology for plant production on the deep sands of North Central Florida. The Suwannee Valley region includes Suwannee, Columbia, Hamilton, Lafayette and Madison counties, and portions of surrounding counties.

Established in 1950 as the Suwannee Valley Experiment Station, the facility's name was changed to the Agricultural Research Center/Live Oak in 1971 and the Suwannee Valley Research and Education Center in 1990. It was renamed as the North Florida Research and Education Center — Suwannee Valley in 2000. It's one of four centers operated by UF's North Florida Research and Education Center in Quincy. The center also has a facilities in Marianna and Monticello. — *Chuck Woods*

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Research Highlights:

- * Demonstrated plastic mulch and drip irrigation to support a new vegetable industry in North Florida.
- * Helped develop and demonstrate use of new biodegradable plastic mulches.
- * Provided leadership in development of alternative crops and production systems.
- * Became main UF center for research and education on hydroponic production.
- * Became regional center for testing new UF strawberry cultivars.
- * Provided leadership in calibration of soil testing equipment for standardized fertility recommendation system.
- * Provided leadership in development of alternatives to methyl bromide soil fumigation.
- * Demonstrated value of plastic mulch and drip irrigation in reducing nitrate contamination of groundwater.
- * Became a major test site for developing data for federal pesticide registration labels on minor use crops.
- * Provides advanced training for more than 200 master gardeners annually.

Northeast Florida Farmers Respond to New Markets

UF's Hastings Research and Education Center is promoting opportunities for alternative crops while helping farmers remain competitive in traditional crops such as potatoes.

By Tom Nordlie

Potatoes may not be Florida's best-known crop, but they have dominated farming in Flagler, Putnam and St. Johns counties for decades.

"Northeast Florida will always produce potatoes, but the market is changing," said Pete Weingartner, interim director of UF's Hastings Research and Education Center. "Until recently, the tri-county area produced up to 34,000 acres of potatoes per year, but production this year is 20,000 acres. About 85 percent of that is sold to potato chip manufacturers during the spring."

Florida growers need to look beyond the potato chip market because supply now exceeds demand, he said. Potato chip consumption has declined, and the industry is controlled by fewer manufacturers. Moreover, new varieties of chipping potatoes developed in northern states have enabled their producers to compete for Florida's spring market.

To help growers remain competitive in today's changing markets, UF researchers are developing new potato varieties and production methods. They're also evaluating alternative crops. Much of this work takes place at the Hastings center, part of UF's Institute of Food and Agricultural Sciences.

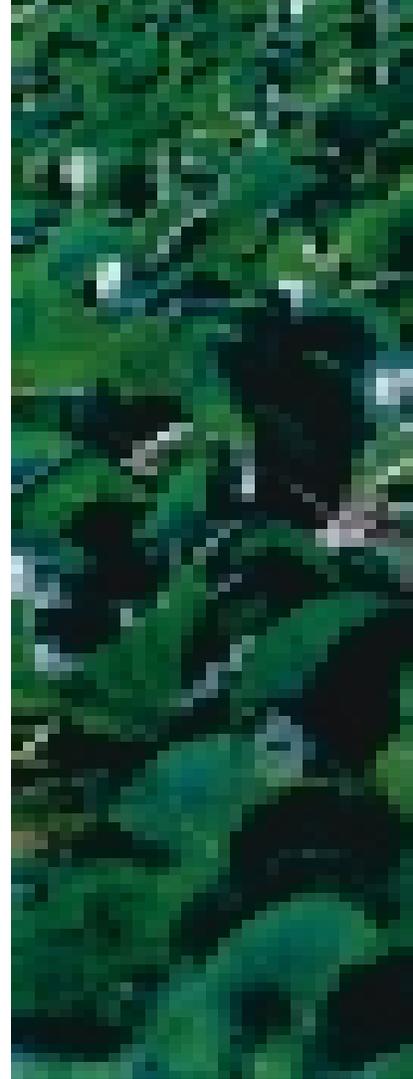
Weingartner said Florida growers could benefit by growing more "fresh market" or "table market" potatoes for supermarket produce sections. Fresh market potatoes now account for 15 percent of northeast Florida potato production.

"Until the 1950s, the area grew nothing but fresh market potatoes," said Weingartner, a plant pathologist at the Hastings center since 1969. "Florida's climate allowed farmers to harvest earlier than other states, so they had an advantage. When potato chips became popular in the mid-1950s, local growers switched to chipping potatoes, but they could switch back to table market potatoes in the future. It's just a matter of growing different varieties and accessing different markets."

He said that the fresh market holds new opportunities and challenges. Consumer demand for fresh market potatoes is constant, but Florida produces potatoes from early March to early July. If Florida growers combined marketing efforts with nearby states, the Southeast could offer fresh market potatoes over a longer period — a bigger market window — which could be a real advantage.

"Also, it would help if we had an identifiable potato that was produced only in Florida or the Southeast — perhaps a brand name comparable to Georgia's famous Vidalia onions," he said. "We're evaluating yellow-fleshed potato varieties that are moister and contain more carotene than white-fleshed potatoes. This might appeal to health-conscious consumers. Carotene is an important nutrient, and moist potatoes taste good with less butter and sour cream."

At the Hastings center, Chad Hutchinson, assistant professor of horticulture, evaluates about 200 new potato





Bill Cotton, left, and Austin Tilton inspect cabbage, a leading northeast Florida crop.

Mitt Putnam

Chad Hutchinson, bottom left, and Pete Weingartner inspect trays of broccoli and brussels sprouts, two alternative crops gaining popularity in northeast Florida.

varieties each year. The most promising varieties are then field tested at farms near UF/IFAS research and education centers in Homestead, Immokalee, Live Oak and Hastings. He said it's important to field test potatoes in areas where they will be produced.

Alternative Crops

Despite changes in the potato market, overall agricultural production in northeast Florida is holding steady at 40,000 acres because farmers are diversifying, Hutchinson said. Thanks to a strong housing market, sod is being produced on 7,000 acres — now the area's No. 2 crop. Green cabbage, another mainstay of northeast Florida farming, is in third place with 3,000 acres, and napa cabbage is gaining popularity. But broccoli is the “up and coming” crop to watch, he said.

“We’ve got 1,000 acres of broccoli now, and that figure should increase thanks to our connection with Maine, the nation’s third-largest broccoli producer,” he said. “For many years, Florida potato farmers have sold their crops to brokers based in Maine, and now many of these same brokers are looking for new broccoli suppliers.”

Growers in northeast Florida also need other alternative crops, Hutchinson said. To reduce financial risks for producers, UF evaluates potentially viable crops before



Mitt Putnam

recommending them. Other possible alternatives include corn, watermelon and green beans. He said some farmers experiment on their own, and Hutchinson helps them deal with unforeseen production problems.

“There are many opportunities, but we have to understand the production needs of each crop, especially if it’s new to the area. That’s why our research and extension programs are so important — we want to identify and correct problems so growers know how to prevent them.”

BMPs Protect Surface Water

While nitrogen fertilizer is crucial for the production of potatoes and other crops, concerns in the St. Johns River Water Management District about nitrate movement into surface water led to the establishment of a new best management practices (BMP) project. Under a grant from the Florida Department of Agriculture and Consumer Services, Hutchinson and Rao Mylavarapu, assistant professor and nutrient management specialist in UF’s Department of Soil and Water Science, are studying combinations of cover crops, nutrients and water management practices in potato production to minimize nitrate leaching.

In a related project, Hutchinson, Mylavarapu and Eric Simonne, assistant professor in UF’s Department of Horticultural Sciences, are evaluating controlled-release nitrogen fertilizers for potatoes, with funds from the water management district.

“BMPs encourage farmers to use the optimum amounts of nitrogen fertilizer needed to grow potatoes and other crops without harming the environment,” said Austin

Tilton, Putnam County extension director in East Palatka. “It’s a balancing act. Application methods are especially important so that more fertilizer is utilized by the plants and doesn’t run off the soil into surface water.”

Bill Cotton, executive director of the North Florida Growers Exchange in Hastings, said farmers are finding that BMPs can save them money. “Even before the BMP recommendations were presented, many growers were reducing their nitrogen use because they thought it was a good idea and a way to save production costs.”

Cotton said UF/IFAS research is essential to the long-term viability of farming in Northeast Florida, adding that the exchange is helping farmers in the area adopt new production practices based upon that research.

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Mitt Putnam

Austin Tilton, left, and Bill Cotton compare notes on cabbage production as tractor driver Odell Ford prepares to move on to the next field.

Sweet Smell of Success

With hundreds or thousands of cows eating, drinking and, well, doing what cows do naturally, dairy farms have earned a reputation for bad odors. Combine that with urban sprawl, bringing city dwellers and dairy farms closer together, and you have a recipe for conflict.

But thanks to new technology developed at UF's Institute of Food and Agricultural Sciences, dairy farms — and swine and poultry operations as well — may come out smelling like a rose as far as their neighbors are concerned.

The new system, called a fixed-film anaerobic digester, is up and running at UF's Dairy Research Unit north of Gainesville after about four years of development, said Ann Wilkie, associate professor of environmental microbiology in the Department of Soil and Water Science. The project is an interdisciplinary effort between her department and the departments of animal sciences and agricultural and biological engineering. Wilkie, who developed the system, said it is capable of reducing odors by about 90 percent.

"Bacteria in the digester convert organic matter in the animal waste into methane and carbon dioxide," said Wilkie. "At the same time, the microbes convert material that cause odor into nonoffensive compounds, so when the processed wastewater leaves the digester it can be applied to the land without the problem of nuisance odor."

She said the new anaerobic digester is faster and more efficient than previous designs because dozens of plastic pipes have been added inside the 100,000-gallon tank. That gives the bacteria more surface area on which to degrade smelly or harmful compounds.

"Normally, bacteria just flow into a digester with the animal waste and then back out again," Wilkie said. "We retain the bacteria inside our system on the plastic pipes. There are miles of surface area inside the tank covered with the bacteria that are the workforce of this system. Since there are more bacteria per cubic foot inside the digester, the system has the ability to do more work."

Wilkie said wastewater remains inside the digester only two days, compared with about 25 days for previous designs or about 60 days when wastewater is treated in anaerobic lagoons.

She said this is the first time this type of technology has been applied to animal waste management. Similar systems have been used by the pharmaceutical and liquor distilling industries, Wilkie said.

UF researchers said the ability to control odors is becoming increasingly important as more rural land is converted to urban uses.

"The dairy farmers benefit because they are able to stay in business," Wilkie said. "And their neighbors will be happy because they are not going to be sitting in their backyards smelling cow manure."

But improving the smell of animal enterprises is not the only benefit of the new system. The farms also get a clean and free source of energy in the process.

"This particular system addresses several environmental issues," Wilkie said. "These include reduced odor, reduced release of greenhouse gases that cause global warming and reduced dependence on fossil fuels."

One byproduct of the digestion process is biogas, a mixture of methane and carbon dioxide. Wilkie said the fixed-film digester produces biogas that is 82 percent methane, while existing units reach only about 65 percent methane. The methane currently is being used to heat water for the Dairy Research Unit, with plans to use it to fuel space heaters in the milking parlor as well.

Additionally, the system will result in less water use, Wilkie said. "We also are able to treat the wastewater to the point where it can be recycled back into the barns, allowing increased water conservation," she said.

As regulations on animal enterprises increase, greater pressure will be placed on farms to manage their waste output effectively, said David Armstrong, farm manager at the Dairy Research Unit. The digester will allow farms to take a waste product and turn it into something useful, he said.

"This system will become more economically feasible as the cost of energy goes up," Armstrong said. "We can use the gas it produces to heat water or generate electricity."

Wilkie said a digester like the one at the 500-milking cow UF dairy could be built for about \$150,000. Once the technology is licensed and put into commercial production, the cost should come down. Also, for larger animal enterprises, economies of scale will come into play, she said. — *Ed Hunter*

Ann Wilkie acwi@gnv.ifas.ufl.edu

Ann Wilkie records data from the new high-tech anaerobic digester at UF's Dairy Research Unit near Gainesville. (Photo by Tara Piasio)



UF Licenses New Mole Cricket Control to Biotech Firm

By Tom Nordlie

A tiny parasite imported from South America by University of Florida researchers will soon be available commercially to end a 30-year battle with mole crickets, one of the most troublesome agricultural pests in the Southeast.

Field tests show that the parasite — a worm-like organism known as the mole cricket nematode — will survive in the region's climate and kill mole crickets on a long-term basis, said Grover Smart, professor of nematology with UF's Institute of Food and Agricultural Sciences. The patented organism, expected to be available by fall 2001, will help farmers, home owners and golf course managers combat the pest.

The mole cricket, which causes about \$94 million in damage to Florida turf and pastures each year, also affects ornamentals and other crops, he said. Damage to grasses and seedlings is caused by the insects feeding on roots and loosening the soil.

Smart said UF experiments with the parasite in North Florida already have caused a decline in local mole cricket populations.

"We just don't see a lot of mole crickets any more in areas where we have tested the parasite," Smart said. "As the nematode spreads, it provides highly effective mole cricket control or at least reduces damage to a level that is

acceptable from an economic standpoint."

Accidentally introduced to the United States from South America more than 75 years ago, mole crickets first became a nuisance to Florida vegetable growers in the 1930s, but were successfully controlled with arsenic baits and pesticides such as DDT. The pest became a serious problem in the 1970s when environmental concerns led to federal restrictions on DDT-type pesticides. Since then, other pesticides have been used with limited success, Smart said.

UF researchers first identified the mole cricket nematode in Brazil during the early 1980s. Smart then isolated a strain of the nematode to achieve almost 100 percent effectiveness against mole crickets in laboratory experiments with little or no threat to other U.S. insects. In 1990, he and UF nematologist K.B. Nguyen identified the nematode as a unique species, *Steinernema scapterisci*. UF holds three patents on use of the nematode for pest control.

Once the parasitic nematode enters the body of a mole cricket to mature and reproduce, it kills the cricket within 48 hours. Young nematodes emerge from the dead cricket about a week later to seek new hosts.

Once infected, mole crickets can spread the nematode to new areas by flying, crawling or burrowing, Smart said.

"The mole cricket nematode is a good example of biological control, using natural predators to control pests without heavy reliance on chemical pesticides," Smart said. "Other mole cricket predators live above ground, but our nematode dwells in the soil where mole crickets do most of their damage — that's the real advantage of this parasite."

MicroBio, a biotech firm owned by Becker Underwood, Inc. in Ames, Iowa, has obtained exclusive rights through UF's Office of Technology Licensing to use the nematode in a commercial product. In late 2001, the company will market the organism under the Nematac S product name, said Graeme Gowling, MicroBio general manager.

"The mole cricket nematode is a good example of biological control, using natural predators to control pests without heavy reliance on chemical pesticides."



Tara Piasio

Grover Smart, left, and Martin Adjei examine a mole cricket, one of the most troublesome agricultural pests in the Southeast.

The product will be marketed to turfgrass and sod farmers as well as home gardeners. Golf courses are expected to be major users, he said.

Gowling said MicroBio, the world's largest commercial nematode producer, is working with a statewide mole cricket task force to help protect millions of acres of cattle pastureland in Florida. However, some ranchers are concerned about the product's cost, which could be as high as \$200 per acre.

"Ranchers who are operating under a tight economic situation just cannot afford to spend that much on mole cricket control," said Herb Harbin, chairman of the agricultural research and education committee of the Florida Cattlemen's Association in Kissimmee. "But we need something to control this pest — the mole cricket problem has been really bad in the last 10 to 15 years. Literally hundreds of thousands of acres of bahia grass pasture have been totally destroyed."

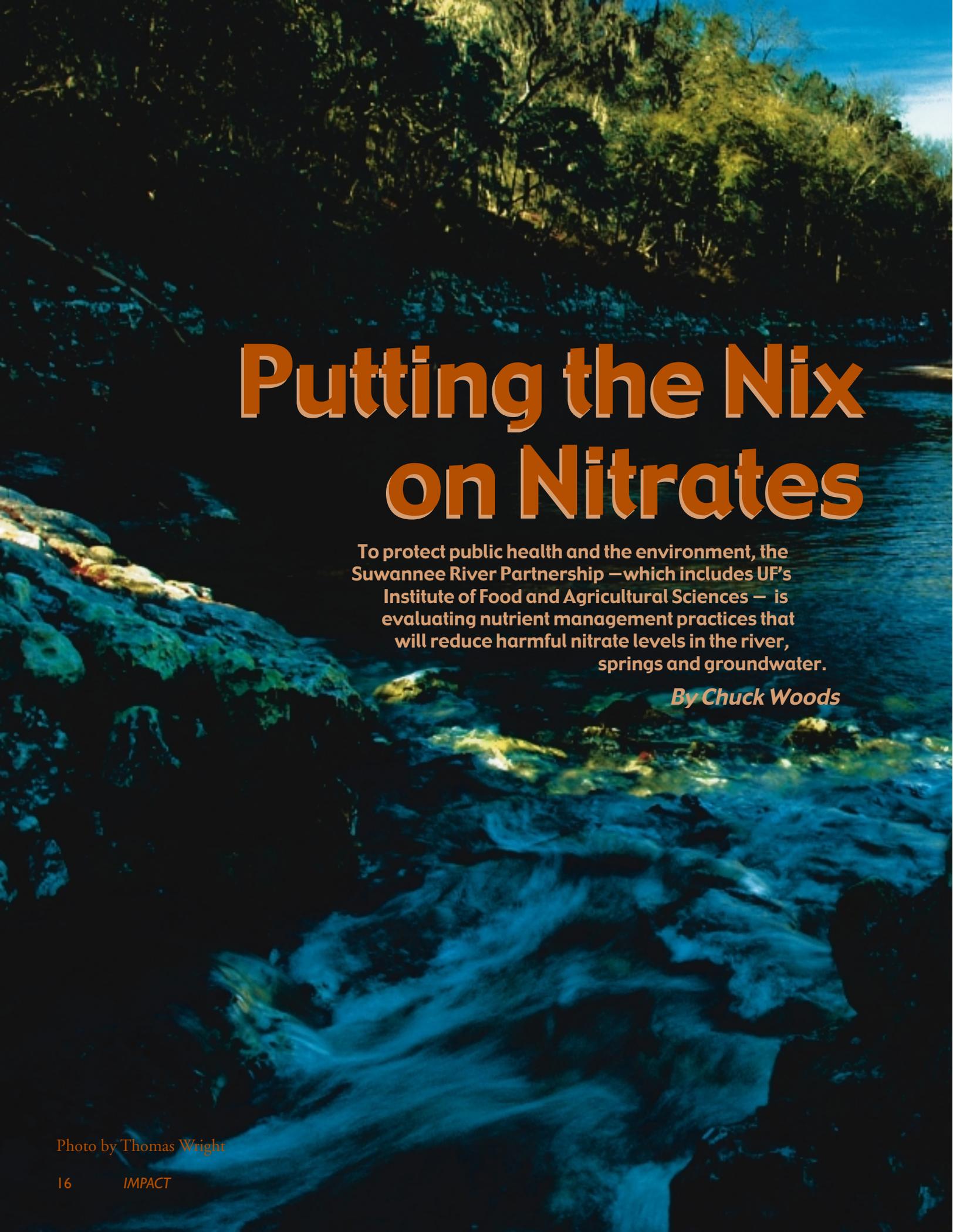
Martin Adjei, assistant professor of agronomy at UF's Range Cattle Research and Education Center in Ona, said cattle farmers could reduce costs by "strip treating"

pastureland, applying the parasite to selected areas while leaving adjacent areas untreated.

"Our research shows that the mole crickets will spread the nematode around once a large number of them are infected," Adjei said. "Now we want to determine how far apart the treated strips should be for effective control of the pest. For example, if we can reduce the treatment to one-eighth of the total area and let the nematodes spread, that may be a cost-effective way for cattle producers to use this product on millions of acres."

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Martin Adjei mba@gnv.ifas.ufl.edu



Putting the Nix on Nitrates

To protect public health and the environment, the Suwannee River Partnership – which includes UF's Institute of Food and Agricultural Sciences – is evaluating nutrient management practices that will reduce harmful nitrate levels in the river, springs and groundwater.

By Chuck Woods



When tests showed that nitrate levels in the water resources of the Middle Suwannee River Basin were increasing, concerns also began to mount about their impact on public health and the environment.

“The federal safety standard for nitrate-nitrogen in drinking water is 10 parts per million, but in some areas we’re finding levels in the 20 to 30 ppm range,” said David Hornsby, water quality analyst with the Suwannee River Water Management District in Live Oak.

The district and the Florida Department of Environmental Protection (DEP) have been monitoring water quality in the basin for the past 12 years. Hornsby said rising nitrate concentrations in the river, springs and groundwater have become “a regional phenomenon” in the past few years.

“The problem could be most serious for infants,” said Elaine Turner, assistant professor in UF’s Department of Food Science and Human Nutrition. “If infants consume formula made with water that exceeds the nitrate health standard, a condition called methemoglobinemia or ‘blue baby syndrome’ can result. Hemoglobin carries oxygen in

the blood, but methemoglobin cannot carry oxygen, causing symptoms of oxygen starvation.”

In addition to making drinking water unsafe, high nitrate concentrations can degrade water quality in rivers and springs, causing algae blooms that consume oxygen needed by fish and other aquatic animals.

In Feb. 1999, concerns about nitrates prompted representatives from agriculture, state and federal agencies, local governments and related associations to initiate the Suwannee River Basin Nutrient Management Working Group, also known as the Suwannee River Partnership.

The partnership, which includes UF’s Institute of Food and Agricultural Sciences (UF/IFAS) along with 23 other members, established technical committees to develop and promote strategies for monitoring and managing animal waste, fertilizer and human waste in the Middle Suwannee River Basin.

Darrell Smith, partnership coordinator with the Florida Department of Agriculture and Consumer



Eric Zamora

Services (FDACS), said the main goal is to determine the sources of nutrient loads in the basin, and to work with local land users to minimize future nutrient loading through voluntary, incentive-based programs.

Results from monitoring and new best management practices (BMP) programs will be made available to all producers during the next eight years.

“The partnership is focusing on finding the most economical and technologically feasible management practices available to help farmers and other land users satisfy the regulatory requirements for protecting public health and the environment,” Smith said. “Through an education and outreach program, the partnership will increase public awareness of the issues, encouraging citizen and community participation to find solutions.”

The Middle Suwannee River Basin, which includes Lafayette and Suwannee counties, has hundreds of

Don Graetz, left, and Wendy Graham measure water depth in a monitoring well at Suwannee Farms.

residential and commercial septic systems in rural areas, about 300 row crop and vegetable farms, 44 dairies with more than 25,000 animals and 150 poultry operations with more than 38 million birds. Suwannee County is the No. 1 poultry production area in the state.

“All of these activities have the potential to adversely affect water quality in the basin,” said Don Graetz, professor with UF’s Department of Soil and Water Science in Gainesville. “At this time, the public perception points to animal waste and fertilizer as the most likely causes.

“Surface and ground waters interact in most of the basin due to the region’s active hydrology and porous soils. The mobility of nitrates, regardless of the source, makes it critical that we carefully evaluate where and how they enter the aquifer,” he said.

Graetz, an environmental chemist who leads the UF research and education effort for the partnership, said many state and federal agencies as well as agricultural producers and associations are working toward the common goal of controlling nitrates. A three-year \$1.4 million grant from DEP and the U.S. Environmental Protection Agency is supporting UF work.

“The agricultural community, which is key to the area’s economy and green space, is just as concerned about protecting water quality as anyone else, and we’re all working together without finger-pointing or blame,” he said.

Graetz and others in the partnership are cooperating with three producers in the basin to monitor groundwater quality and evaluate the effectiveness of various BMPs. Those working with the partnership include Barnes Poultry Farm in Live Oak, Byrd Dairy Farm in Mayo and Suwannee Farms in O’Brien, which produces row crops and vegetables under more than 40 center pivot irrigation systems on 5,000 acres.

Kenneth Hall, manager of Suwannee Farms, said the project provides a unique opportunity to observe nitrate movement through the soil in relation to crop development and irrigation or rainfall. “If we can do a better job of maximizing nutrient and water efficiency while maintaining economic sustainability, we certainly want to be among the first to do so,” he said.

George Hochmuth, director of UF’s North Florida Research and Education Center (NFREC), is developing BMPs to be implemented at Suwannee Farms.

Other UF faculty working on the project include Wendy Graham, professor and hydrologist in UF’s Department of

Agricultural and Biological Engineering, who is monitoring soil and groundwater quality and water movement at all three farms. Data will be used to evaluate BMPs and develop computer models for predicting the impact of various nutrient and water management practices on groundwater quality and crop yield under different soil, weather and cropping conditions.

“We have 13 to 20 monitoring wells at each one of these farms, and we’re currently measuring nitrate concentrations in soil and groundwater under existing management practices,” she said. “At Suwannee Farms, our monitoring wells are under one of their large (140 acre) center pivot irrigation systems.

“In early 2001, we will begin implementing BMPs on this center pivot to help protect groundwater while maintaining profitable crop yields. As new fertilizer and irrigation management practices are tested over the next two years, we will continue to evaluate water quality and crop yield, making further adjustments as needed,” Graham said.

Rao Mylavarapu, assistant professor and nutrient management specialist in the soil and water science department, is developing nutrient management plans that account for all nutrients put on the crops at the three demonstration farms in the partnership.

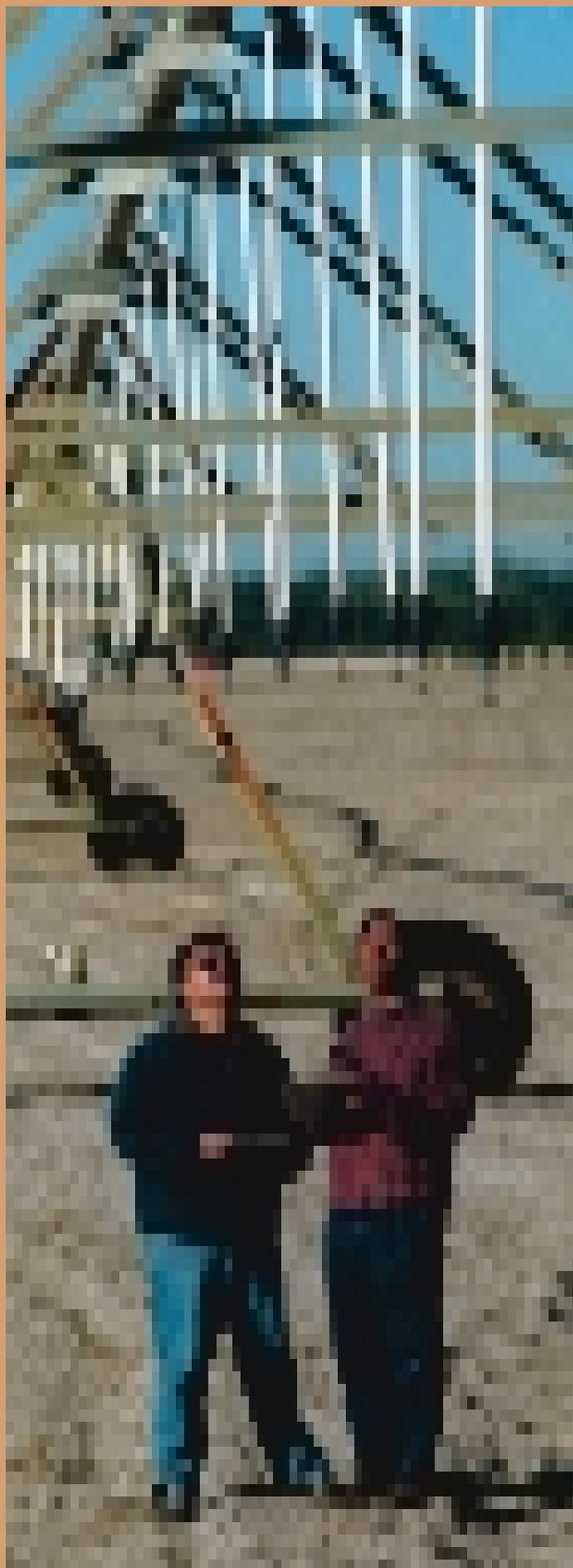
“We need to develop new cropping systems based upon the exact nutrient needs of plants, which will minimize nutrient losses to the environment,” Mylavarapu said. “The efficiency of nutrient utilization by crops can be improved by fine-tuning existing fertilization practices, thereby reducing nutrient leaching through the soil into groundwater. New BMPs that combine nutrient and water management — particularly application rates and timing — will hopefully optimize cultural practices in the Suwannee Valley basin.”

Nutrient management plans, which incorporate various BMPs, for Bryd Dairy Farm and Barnes Poultry Farm are being developed by another partnership member, the U.S. Department of Agriculture’s Natural Resource Conservation Service. Conservation management practices for dairy farms likely will include application of animal wastes on pastures and crops from storage lagoons while poultry farms will spread wastes hay on crops.

Hochmuth said the Livestock Waste Testing Lab at NFREC’s Suwannee Valley center in Live Oak is working with the partnership to provide precise analysis of nutrients in manures at the animal farms.

“This gives producers a better idea of what nutrients are being applied to crops and fields,” he said. “Researchers at the Suwannee Valley center also are developing other BMPs for crops in the Suwannee River basin area, including vegetables and hay crops. These projects are funded by the FDACS Nitrate BMP project.”

Rao Mylavarapu, right, and graduate student Jaime Sanchez discuss water management practices at Suwannee Farms. Sanchez is working on his doctoral degree in soil and water science in UF’s College of Agricultural and Life Sciences.



Eric Zamora

Members of the Suwannee River Partnership, also known as the Suwannee River Basin Nutrient Management Working Group:

- Florida Department of Agriculture and Consumer Services
- Florida Department of Environmental Protection
- Florida Department of Health
- Florida Department of Community Affairs
- Suwannee River Water Management District
- U.S. Environmental Protection Agency
- U.S. Department of Agriculture, Natural Resources and Conservation Service
- U.S. Geological Survey, Water Resources Division
- University of Florida Institute of Food and Agricultural Sciences
- Florida A&M University
- Florida Rural Water Association
- Suwannee County Commission
- Suwannee River Soil and Water Conservation District
- Lafayette County Commission
- Lafayette Soil and Water Conservation District
- Suwannee River Resource Conservation and Development Council
- Gold Kist, Inc.
- Sunshine State Milk Producers
- Florida Farm Bureau Federation
- Florida Cattlemen's Association
- Florida Fertilizer and Agrichemical Association
- Florida Forestry Association
- Florida Poultry Federation, Inc.
- Florida Septic Tank Association

Web site: <http://www.srwmd.state.fl.us>

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Suwannee Estuary Study

In a separate UF/IFAS project, Ed Philips, associate professor in the Department of Fisheries and Aquatic Sciences, is leading a study on elevated nitrate concentrations in the seafood-rich estuary at the mouth of the Suwannee River on the Gulf of Mexico. His research, funded by the Suwannee River Water Management District in Live Oak, covers 800 square miles at the mouth of the river, from Cedar Key north to Horseshoe Beach and 20 miles offshore. It also includes water 50 miles up river.

“High nitrate levels in the river, springs and groundwater are flowing into the estuary, contributing to the nutrient supply for algae blooms,” Philips said. “We know that high levels of algae can cause problems with low oxygen, which poses a threat to the health of fish and other marine animals.”

In 2001, Philips will begin two new projects funded by U.S. Department of Agriculture to investigate the consequences of algae blooms on the productivity of clams and oysters, two of the region’s most important natural resources.

Estuary photo by Eric Zamora

Ed Philips, left, and Aerin Bledsoe, a graduate student working on her doctoral degree in fisheries and aquatic sciences, measure water quality in the Suwannee River system.



Milt Putnam



High Water Mark

With a top national ranking, the Florida Sea Grant College Program is poised for future expansion.

By Ed Hunter

No. 1 in the nation! That's how the National Sea Grant Program Assessment Team has ranked the Florida Sea Grant College Program based at the University of Florida.

A new national process reviews each of the 30 state Sea Grant programs every four years, said James Cato, professor and director of Florida Sea Grant. In April 2000, the Florida program was the 16th to be reviewed since 1998 and received the highest score possible — excellent — in all categories.

“A few other programs may be ranked as high as us, but none can be ranked higher, and our ranking is significantly higher than the first 15 programs reviewed,” Cato said.

The excellent rating will help the Florida program compete for state and federal funds and launch new programs, he said. It also means a “merit” increase will be added to Florida Sea Grant’s federal funding for the next four years. The Florida Sea Grant College Program was initiated in 1972 with funding from the U.S. Department of Commerce and the National Oceanic and Atmospheric Administration.

“We earned this ranking because of the excellent faculty, staff and students working in our statewide research,

extension and communication programs,” Cato said. “Fifteen public and private universities and research laboratories participate in Sea Grant statewide. We continue to receive strong support and participation from the universities, citizens, businesses and agencies that provide required matching funds to help science serve Florida’s coast.”

He said faculty and students in UF’s Institute of Food and Agricultural Sciences conduct many Florida Sea Grant research, extension and communications activities. “Through research, they create scientific discovery; through extension, they make sure local needs are addressed, and through extension and communications, they make sure the public gets the results in a form they find useful,” Cato said. Examples of programs in North Florida include the following:

Artificial Reefs

When Taylor County residents in Florida’s Big Bend area wanted to establish an artificial reef program to enhance local fishing and scuba diving, they turned to Florida Sea Grant for help.

Thomas Wright

Craig Aubrey, Taylor County marine agent in Perry, said creating new artificial reefs is not as easy as it used to be.

“The days of being able to go out and drop a car off the back of a boat are over,” he said. “Getting approval to place things in the water is now a complicated process, requiring approval from agencies such as the Florida Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers.”

He said the acceptable list of reef materials is now essentially limited to concrete objects and steel — structures that will stand the test of time and not pollute the ocean. Reef builders also need to make sure materials are placed on a hard ocean floor and that they will not damage coral reefs or sea grass.

Thanks to Aubrey’s work, one offshore artificial reef is being renourished near Keaton Beach with materials donated by a local business.

“By this coming summer, we plan to have a fish identification course set up for the volunteer diving team,” he said. “This course will help the dive team monitor reefs, which will be important when the county pursues grant funding for the construction of more reefs.”

Whole Scallops

To make scallop farming profitable, Florida Sea Grant researchers have conducted a study to determine how the dining public responds to whole scallops served in the shell.

Don Sweat, Sea Grant marine extension agent for Levy, Citrus, Hernando, Pasco and Pinellas counties, said Florida farmers cannot make money by selling only the scallop meat.

“We cannot compete with frozen scallop meat imported from China,” he said. “They are raising the same animal and

shipping the meat to the United States far below our production costs.”

Sweat worked with Norman Blake, a University of South Florida scallop expert, to learn that Florida producers could raise whole scallops economically. The cost of raising scallops to a marketable size would be about 8 to 10 cents each, and they could be sold to consumers for 20 to 25 cents a piece.

In the study, whole scallops were provided to four upscale restaurants in Cedar Key, Gainesville and Inglis by Chuck Adams, UF Sea Grant extension economist, and Robert Degner, professor in UF’s Department of Food and Resource Economics. The scallops were promoted as a special item on the menu, and diners were asked to complete a survey following their dining experience. Adams said a majority of the diners indicated they would purchase whole scallops again. In fact, 95 percent said it was an “excellent” product.

Clam Insurance

While many Florida Sea Grant programs have helped clam farmers, a pilot insurance program has been particularly useful, said Leslie Sturmer, a Levy County extension aquaculture agent in Cedar Key.

Traditional farmers have relied on the U.S. Department of Agriculture for federally subsidized insurance programs that protect them in the event of losses due to weather. Now, thanks to Sturmer’s efforts, clam farmers can obtain the same kind of “crop insurance” to protect their operations.

“Clam farmers are the first in the aquaculture industry to be eligible for a federally subsidized insurance program,” Sturmer said. “When it comes to aquaculture crops, this is a first for the USDA. As a result, aquaculture crop losses are now defined by USDA like any other type of crop loss.”

Eric Zamora



Leslie Sturmer examines clam seed that were remote set in a land-based nursery system. This technology, used in the Pacific Northwest oyster industry, is being evaluated by Florida Sea Grant for the Florida clam culture industry as a way to provide inexpensive clam seed to nursery operators.

Seafood Safety

A national supply of high quality and safe seafood, both domestic and imported, continues to be a prime objective of the Florida Sea Grant program.

To meet that goal, Florida Sea Grant is providing national leadership in the new Hazard Analysis and Critical Control Point (HACCP) inspection system, which identifies and controls every step or stage of the production process where bacteria and toxic chemicals can slip into the food supply.

Seafood was the first food group brought under the new federal food safety program, and all processors engaged in interstate commerce were required to comply with new seafood HACCP regulations by December 1997.

They were able to meet that deadline thanks to the National Seafood HACCP Alliance organized and directed by Steve Otwell, professor and Sea Grant seafood specialist in UF's Department of Food Science and Human Nutrition. Otwell's leadership of the alliance, which he organized in 1994, is supported by Florida Sea Grant and the National Sea Grant Collage Program.

He said more than 10,000 people nationwide have been trained in HACCP methods. As a result, HACCP is becoming the world standard for food safety. It's required by the European Union and is widely used in Canada.

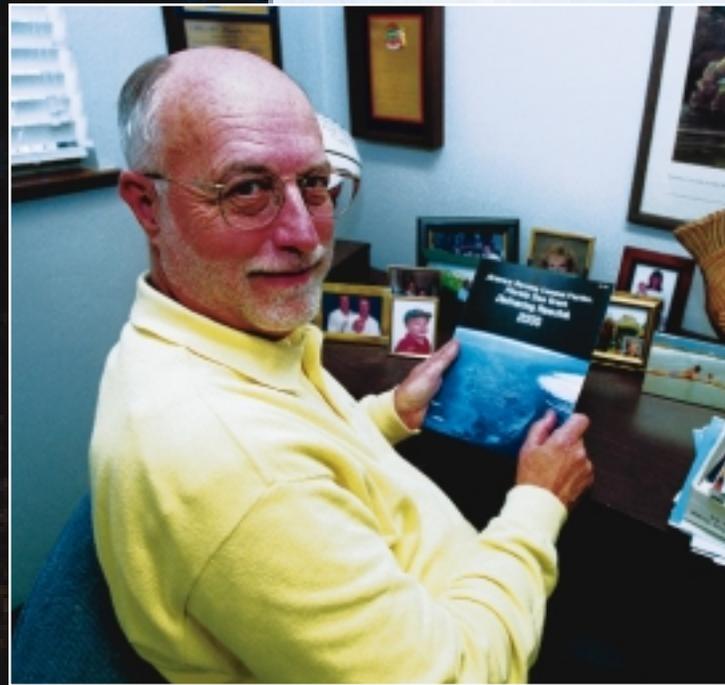
Other Programs

Since 1997, Florida Sea Grant has worked with fishermen who lost a major source of their income as a result of the 1995 ban on net fishing. With the help of a \$350,000 state grant, Florida Sea Grant, in cooperation with a number of other agencies, offered a series of workshops and provided technical assistance to help fishermen learn how to harvest blue crabs and establish shedding operations to produce the desirable soft shell crabs. More than 60 fishermen were in business after the first season.

The Urban Boating and Anchorage Management Program works with recreational boaters, teaching them proper techniques in navigation and anchorage. It also tests self-regulation concepts. Through this educational program, Florida Sea Grant was able to convince DEP to avoid issuing new regulations that would have a negative impact on recreational boaters. During 2000, this program was given a Leadership Award by the Council for Sustainable Florida, and it was recognized by a December 2000 resolution by Gov. Jeb Bush and the Florida cabinet.

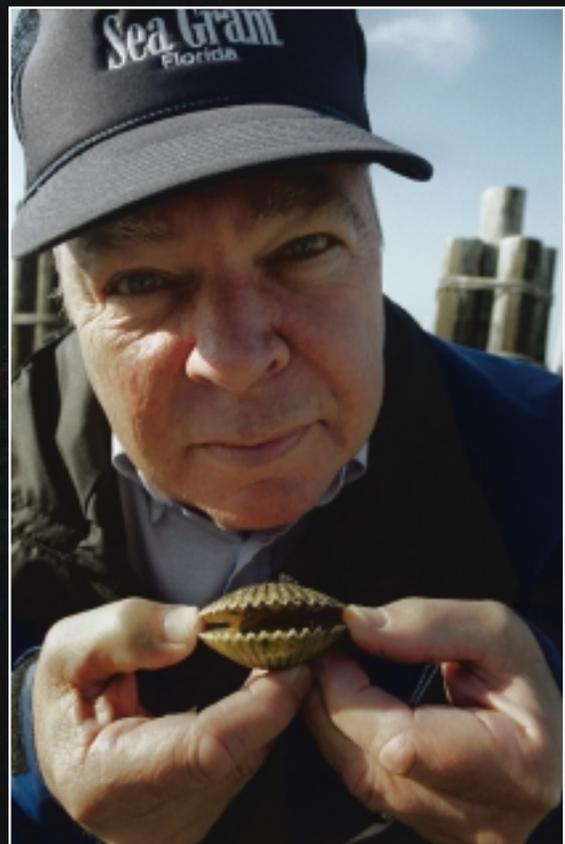
UF researchers are evaluating methods that would allow marine ornamental fish species to be produced by the state's aquaculture industry. If marine fish could be raised commercially, it would reduce the need to harvest them from environmentally sensitive coral reefs worldwide.

James Cato jcato@mail.ifas.ufl.edu



Jim Cato reviews the Sea Grant 2000 annual report, "Science Serving Coastal Florida: Florida Sea Grant Delivering Results!" Results!

Don Sweat displays a Florida scallop.



Photos by Eric Zamora



Craig Aubrey, above, inspects steel casings being evaluated for use in an artificial reef structure.



Don Sweat, right, checks beakers containing algae used to feed larval scallops until they're large enough to be sent to scallop farms.



Volunteers: The Heart of 4-H

By Ami Neiberger



She can't leap skyscrapers with a single bound. She doesn't have super powers. And her name may not be Xena or a comic book superstar, but she's a hero all the same.

Her name is Betty Stewart. She helps kids every week with their homework at an after school center in Jacksonville and runs a 4-H EFNEP (Expanded Food and Nutrition Education Program) club. The youth in her club have cooked countless meals together, learning about healthy nutrition. They've even done the 4-H pledge to a rap beat.

Stewart couldn't swim but she went to camp at 4-H Camp Cherry Lake anyway a couple of years ago for a week with the kids. "I remember there was this one boy who could not dance," said Stewart. "But he could jump and kick. Everyone gave him plenty of room and he enjoyed himself."

The retired secretary chuckled at the memory. She was never in 4-H growing up, but her dedication and commitment to young people are similar to that held by thousands of other 4-H volunteers across the Sunshine State.

Florida's 241,000 youth ages 5-18 interacted with more than 13,374 volunteer 4-H leaders last year. About 1,500 of those leaders were teenagers and the remainder were adults.

"They are the wings beneath county extension 4-H programming because they amplify the impact of a 4-H agent on a community and on youth," said Damon Miller, state 4-H leader and assistant dean for the 4-H youth development program with UF's Institute of Food and Agricultural Sciences.

Having volunteers is critical to the development of young people. "Youth gain invaluable development opportunities by interacting with caring and compassionate adults who serve as mentors, educators and role models for them," said Miller.

North Florida offers many examples of caring adult volunteers, said Miller. He said that it is typical for county 4-H programs to have a variety of roles for volunteers to fill. They might be working as community club leaders, helping at an after school program, or assisting in the office, at the fair, or on a county foundation board.

Suwannee County



Willie Haas has been a 4-H volunteer for more than 55 years in McAlpin, a small town located in rural Suwannee County. The McAlpin 4-H Club has done a Community Pride project for several years, assisting with the construction and maintenance of a community center and doing an adopt-a-highway project.

The lessons Haas teaches have paid off. "She always felt that you need to know how to communicate with people, whether you are a store clerk or a professional," said Greg Hicks, Hamilton County 4-H agent in Jasper, who was in her club as a youngster and credits her insistence that everyone learn public speaking as an important part of his own growing up.

It is unusual to have a 4-H volunteer who sticks with the program after their own children are grown, said Tricia Heijkoop, Suwannee County 4-H agent in Live Oak. "She has a dedication to the program and enjoys being with kids," said Heijkoop, who says that Haas rarely misses a meeting even today.

Top photo: Bill Heltemes, right, and Shail Ramcharan, discuss how to give a good presentation at a 4-H club meeting.

Middle photo: Bill Heltemes gives a presentation to the "Fun, Fun, Fun, and More Fun 4-H Club" in Alachua County.

Bottom photo: Lorraine Williams, center, plants petunias with Monieke Hall, 7, and Xzavius Hill, 6, in the garden of the Gainesville housing development where Ramcharan's club meets. Williams was a volunteer before she became an extension employee. (Photos by Thomas Wright)



Tricia Heijkoop, left, and Willie Haas, right, practice painting with McAlpin 4-H club members Dana Anderson, 9, middle left, and Samantha Gerhaus, 9, middle right. (Photo by Eric Zamora)

Haas has turned over some of her duties to a new volunteer leader, but she still attends club meetings and serves as the club's advisor. She received a special award at the 2000 Florida 4-H Congress for her devotion to young people.

Alachua County



An afternoon found 4-H volunteer Shail Ramcharan rushing to get her office organized before the invasion of kids in the "Cedar Ridge Fun, Fun, Fun and More Fun 4-H Club" turned the place upside down.

The name was chosen unanimously by the youth, and the club meets three times a week at the Cedar Ridge complex in Gainesville, a subsidized housing area facing problems with drugs, crime and poverty. The club is sponsored by the Alachua County Partners for a Healthy Community initiative.

"These kids are telling you how they feel in what they choose," said Ramcharan, who says that they stay busy with activities like a youth-written newspaper, leadership development, public speaking and creative arts expression projects. The club also does clean-up projects in the community.

She has only been a 4-H club leader for four months and is a program specialist employed by Alachua County's Community Support Services. But it's clear that her commitment to the young people goes much further than just her job. She says that every child has great potential, and she's clearly their biggest cheerleader.

4-H Club Leader Training



Training people to be good 4-H club leaders can be a challenge, said Bill Heltemes, Alachua County 4-H agent. Heltemes developed a training program that Ramcharan participated in, with the aid of a grant from the Florida 4-H Foundation.

Putting the label "leader" on someone automatically carries certain expectations, said Heltemes. "If you haven't had any training, it can be kind of scary," he said. The

training is seven sessions long and teaches club leaders how to organize meetings and work with young people.

The lynchpin to keeping volunteers is not just training them well, but also looking into their motivations for volunteering. Long-term volunteers have a commitment to young people, said Heltemes, because the longer they stay the more they can see what is happening with the kids.

"When kids come back a few years later and tell you what a good experience they've had, the volunteers are always surprised," said Heltemes. "Because you don't always know what impact you are making."

And that's not the only reason. "A lot of people volunteer because they want to give something back to society," said Rick Rudd, assistant professor in UF's Department of Agricultural Education and Communication, who is heading up the new Center for Volunteer Leadership Development.

"They also want to have a sense of satisfaction," said Rudd, who says it is important for extension agents to learn how to develop volunteers and is launching a training course this summer.

4-H is expanding its volunteer base nowadays to include many people who were never in 4-H as children. Especially in urban areas, it is hard to find people who grew up in 4-H, Rudd said. Ironically, of the three volunteers mentioned above, only Willie Haas was in 4-H in her youth. Both Stewart and Ramcharan are "green" to 4-H.

Recruiting is not as difficult as training and retention, said Anita McKinney, 4-H agent in Duval County where Stewart is. The 4-H program there has more than 300 4-H volunteers. "The better trained they are, the longer they will stay," she said.

Recruitment Campaign

Recruiting remains a tough nut to crack. Consequently, the state 4-H program is launching a new volunteer recruitment campaign this year with the Florida Department of Agriculture and Consumer Services (FDACS) to attract more capable and caring adults.

"Being able to make a difference in the life of a child is one of the most amazing things any of us can do," said Nelson Pugh, director of marketing and information for FDACS and one of the biggest supporters of the new campaign.

"The potential to impact kids through 4-H is enormous," said Pugh. "Volunteering really gets to the heart of the matter — for both the kids and the adults building bonds with those kids. We all walk away touched to the soul."

Visit Florida 4-H online at <http://4h.ifas.ufl.edu>



FAWN to Offer Statewide Coverage with New Monitoring Sites

By Chuck Woods

To fill major gaps in coverage, the Florida Automated Weather Network will add 10 new monitoring stations in the next two years, providing “real time” weather data 24 hours daily to agricultural producers and others throughout the state.

The computerized network, also known as FAWN, was started by the University of Florida in 1997 after the National Weather Service discontinued forecasts for agriculture and other special groups,” said Larry Treadaway, network coordinator with UF’s Institute of Food and Agricultural Sciences. Since its inception, network coverage has been limited to Central Florida and South Florida.

“We need a complete statewide network because regular forecasts for cities may be misleading to farmers located in cooler rural areas,” he said. “Heat trapped in concrete and asphalt can make cities 10 degrees warmer than farms in rural areas. When cold weather moves through the state, the difference can be devastating to citrus and other cold-sensitive crops.”

Treadaway said growers and others interested in real time weather data can access the system by telephone or via the FAWN Web site. In addition to data, the system can give farmers reliable climate predictions three to six months in advance.

The network now includes a total of 21 monitoring stations where weather data is continuously collected and transmitted to a UF computer in Gainesville every 15 minutes. During the past two years, new monitoring stations were added at Alachua, Brooksville, Citra, Ft. Lauderdale, Hastings and Putnam Hall to improve coverage.

The new Alachua station is located at the UF Department of Agronomy’s Forage Research Unit near Gainesville. The Brooksville facility is located at the U.S. Department of Agriculture’s Subtropical Agricultural Research Station, which provided funding for equipment. The Citra station is located at UF’s Plant Science Research and Education Unit. The Hastings station is located in southwest St. Johns County.

Treadaway said complete statewide coverage will become a reality by the end of 2002 when new monitoring stations are constructed in Live Oak, Monticello, Quincy, Marianna and Jay. Additional monitoring stations will be added at Bronson in Levy County and yet-to-be-determined sites in Baker or Union County, Brevard County, Highlands County and Osceola County.

When the sites become operational, the network will have a total of 31 monitoring stations. The Division of Emergency Management in the Florida Department of Community Affairs is providing \$125,000 to complete the system.

Andy King, who coordinates the FAWN database and Web site at UF, said each solar-powered weather station measures temperatures at two, six and 30 feet above ground, soil temperature, wind speed and direction, rainfall, relative humidity, barometric pressure, leaf wetness and solar radiation.

“We invite everyone to visit the FAWN Web site to see current weather conditions as well as the unique and educational weather data graphing java applet,” King said. “Also available are daily, weekly and monthly data summaries, charts of chilling degree days and historical data charts.”

The FAWN database and Web site are maintained by UF’s Office of Information Technology, which is adding new features to the service to help agricultural producers manage their operations more efficiently.

“Growers are looking at FAWN as a source of reliable information not only for cold protection, but also for

weather-driven computer models in pest control, irrigation scheduling, fertilizer rates and other management programs. It’s all part of the growing trend toward precision agriculture,” King said.

Another new component of the FAWN Web site, Climate Predictions, provides information on weather trends over the next three to six months from the Florida Consortium for Climate Prediction Applications. The consortium includes scientists at UF, Florida State University and the University of Miami.

Jim Jones, professor in UF’s Department of Agricultural and Biological Engineering who works with the consortium, said the group develops regional assessments of climate variability and impacts of climate forecasts on the Americas, including the U.S. Southeast.

“The consortium has developed methodologies to identify climate variability patterns in temperature and precipitation associated with El Nino and related weather events,” Jones said. “This will help us determine the vulnerability of agriculture and production systems to major

Larry Treadaway performs routine maintenance at the FAWN monitoring station near Alachua.





Eric Zamora

Andy King, left, said FAWN received more than 20,000 hits during freezing weather in Florida this winter.

“As a public domain network, FAWN provides weather data from surface locations that can be used by the National Weather Service and private firms to develop accurate short-range and long-range forecasts. The data also is very valuable to growers by providing localized weather information when a freeze is actually occurring,” Jackson said.

Weather data from the network is available on the FAWN Voice Data System at (352) 846-3100 or at the FAWN Web site: <http://fawn.ifas.ufl.edu>

“For the price of a phone call to Gainesville, growers can access a user-friendly, voice-synthesized information system to obtain real-time weather data from these sites 24 hours daily,” said Pat Cockrell, director of agricultural policy with the Florida Farm Bureau in Gainesville and chair of the weather task force. “Growers can get specific weather data directly from stations located in or near their local production areas.

“FAWN is a major step forward in developing accurate and reliable weather data, and we hope growers will find the network to be a valuable asset in their farming operations,” Cockrell said.

Other task force participants include Florida Citrus Mutual, Florida Nursery and Growers Association, and the Florida Department of Agriculture and Consumer Services. The office of U.S. Sen. Bob Graham, D-Fla., also participated.

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climate variations that may produce drought, flooding or increased storm activity.”

John Jackson, a Lake County extension agent who helped establish the network in 1997, said the agricultural weather data information service originally was designed to help warn the state’s \$7 billion fruit, vegetable and environmental horticulture industries about devastating freezes.

“When Congress pulled the plug on specialized frost and freeze warnings in 1996, most growers were not aware of the federal cutback,” said Jackson. “But the January 1997 freeze changed all that.

“The costly and largely unpredicted freeze hit Central and South Florida, causing a \$300 million loss and leaving many growers feeling burned by the available weather forecasting system,” Jackson said. “At that point, the need for accurate and timely agricultural weather information became urgent.”

Jackson said various grower organizations, spearheaded by the Florida Fruit and Vegetable Association in Orlando, formed the Florida Agricultural Weather Task Force in cooperation with UF. The task force helped obtain funding for UF to develop and operate the first phase of the network based in Gainesville.

DON'T FORGET YOUR FOLATE!

New findings on the value of folate in the diet will help maintain optimal health and reduce disease risk in the nation's rapidly increasing senior citizen population.

In the first study ever to measure the amount of folate needed by older women, researchers with UF's Institute of Food and Agricultural Sciences say consuming a folate-rich diet every day can benefit women well into their golden years.

Folate is a water-soluble vitamin needed by all cells for normal cell division. It also participates in reactions that help the body use nutrients such as amino acids. An elevated level of one of these amino acids, homocysteine, is now recognized to be a risk factor for heart disease, said Lynn Bailey, professor in UF's Department of Food Science and Human Nutrition.

"Our study provides evidence that adequate folate intake plays a key role in reducing homocysteine, which is particularly relevant for elderly women since heart disease is the primary cause of death in this group," said Bailey, who has conducted folate research for the past 22 years.

She said the potential impact on nation's elderly population is enormous. In Florida, more than 25 percent of the state's population will be older than 65 by 2025.

"Dietary intake recommendations for folate have been based exclusively on studies conducted in younger women and have not considered the impact of genetics," she said. "Our research was the first controlled study to evaluate the adequacy of folate intake in women over 65 years of age and to examine the potential influence of genetic makeup."

Gail Kauwell, associate professor in the department who also worked on the project, said another important aspect of their research relates to the observation that inadequate folate intake was associated with a specific change in the structure of DNA. She said other studies have linked this structural change to an increase in risk for certain types of cancers.



"These data suggest that along with heart disease, adequate folate intake may be associated with risk reduction for another major chronic disease in our aging population," she said.

Kauwell and Bailey co-directed the study that examined several different aspects of folate requirements, the results of which were published in three scientific journals. In their study, 33 postmenopausal women ages 60 to 85 were fed a low-folate diet for 7 weeks followed by 7 weeks of a folate-adequate diet that included orange juice, a rich source of folate, and foods fortified with folic acid.

One of the primary conclusions of the study was that a mixed diet that provided 400 micrograms of folate per day significantly decreased blood homocysteine levels. The researchers also observed that the impact of a low folate diet varied with genetic makeup.

"When folate intake was inadequate, blood homocysteine levels increased more in women who had a specific mutation in the gene that makes a key folate requiring enzyme," Kauwell said.

To get enough folate in their diets, consumers can turn to naturally occurring sources of folate, folic acid enriched products or supplements.

"Food sources containing natural folate include orange juice, the most popular source of natural folate in the American diet, as well as strawberries, dark green leafy vegetables, asparagus, peanuts, and dry peas and beans. Floridians are fortunate to live in a state where many of these folate-rich foods are major commodities. The challenge is to encourage consumers to increase their intake of fruits and vegetables with particular emphasis on those that are folate-rich," Kauwell said.

Since 1998, the Food and Drug Administration has required certain foods to be fortified with folic acid, including bread, cereal, pasta, flour, crackers and rice. While fortified foods and folic acid supplements are recommended for women of reproductive age, Bailey advises women and men of all ages to include foods naturally high in folate in their diet.

"Foods naturally containing folate also provide many other nutrients women and men need. In general, these foods are good sources of vitamin C, fiber, and potassium, and most are low in fat," Bailey said. — *Chuck Woods*

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Gail Kauwell, left, and Lynn Bailey conduct folate research at UF's Department of Food Science and Human Nutrition in Gainesville. (Photo by Tara Piasio)



Sometimes It's Nice to Fool Mother Nature

*L*arry Gillard, left, owner of Gillard Farms in Lawtey, Fla. and David Dinkins, Bradford County extension director in Starke with UF's Institute of Food and Agricultural Sciences, check strawberry plants in a refrigerated trailer. Dinkins said the plants need chilling to set fruit, and artificial chilling tricks them into producing an early crop when other U.S. production areas are not harvesting berries. After two weeks of chilling in trailers, 14,000 plants were planted outdoors in September 2000 so they could begin setting fruit for a November harvest. The UF extension demonstration project, funded by a \$10,000 Sustainable Agricultural Research and Education (SARE) grant from the U.S. Department of Agriculture, is designed to help North Florida growers produce a crop when market prices are high and competition from other producers is low.

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(Photo by Thomas Wright)