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From the Chair...

The Soil and Water Science Department (SWSD) has a cadre of extension faculty who offer public service programs through IFAS Florida Cooperative Extension Service that help Florida's citizens solve a wide variety of agricultural, urban, and natural resource problems across the state. Extension is a partnership between state, federal, and county governments to provide scientific knowledge and expertise to the public. The SWSD extension programs address soil and water quality issues in a range of ecosystems including: agricultural lands, forested lands, range lands, urban lands, and wetlands and aquatic systems (springs, shallow lakes , rivers, and estuaries). Florida's water resource issues of concern center on water quality impairment by nutrients and competition for freshwater supply. Thus, a large portion of the Department's extension effort is directed towards nutrient and water management for crop production and water quality protection in agricultural, recreational, and urban settings. In addition, programs are also offered on the importance of natural systems and wetlands in maintaining watershed health. The ultimate goal of our statewide extension effort is to help Florida strike a balance between viable agricultural production, urban growth, and natural resource protection that maintains a high quality and plentiful water supply for all users.

The SWSD extension faculty translate current, relevant soil, water, and environmental science knowledge into user-friendly formats for Florida residents, visitors, industry, business, governmental agencies and county agents. Formats include publications, presentations, in-service training, videos and computer software. The SWSD faculty's basic and applied research supports extension efforts by addressing current and anticipated land, soil, and water resource uses and potential environmental problems. The UF/IFAS Extension Soil Testing Laboratory (ESTL) managed by SWSD offers a variety of tests for mineral soils, container media and irrigation water. Information about these tests can be obtained either directly from the ESTL or by contacting your local County Extension Office. Additional information can be found at: http://soilslab.ifas.ufl.edu or by contacting ESTL at: soilslab@ifas.ufl.edu . The Department is committed to excellence in extension education. Additional information on our extension programs can be found at: http://soils.ifa.ufl.edu/extension and http://solutionsforyourlife.ufl.edu

Alumni: We want to include you in our newsletters! Please provide highlights of your current activities with a photograph to Michael Sisk at mjsisk@ufl.edu.

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IFAS Extension Long Range Plan

UF/IFAS Extension Administration is about to release a Long Range Plan document that will guide our educational program efforts for the next 5 to 10 years. This document was developed following clientele listening sessions in every county, focus group meetings, an on-line survey, and a statewide faculty summit. The main issues on the minds of Floridians included personal and family well-being, economy and jobs, and Florida's environment. Seven major initiatives emerged during the development of this plan. Initiatives with closest ties to the Soil and Water Science Department include 1) Increasing the Sustainability, Profitability, and Competitiveness of Agricultural and Horticultural Enterprises, 2) Enhancing and Protecting Water Quantity, Quality, and Supply, and 3) Enhancing and Conserving Florida's Natural Resources and Environmental Quality. Our department will also likely be associated with initiative #4, Producing and Conserving Traditional and Alternative Forms of Energy. Since our department's extension programs are heavily involved with agricultural and horticultural production, water quality enhancement, and the protection of natural systems, it is obvious that Floridians will need our educational efforts more than ever during the next decade. For more information, contact Tom Obreza at obreza@ufl.edu.

Orchard Design for Sustainable Citrus Production in HLB-Endemic Florida

Sustainable production of high fruit yield is possible after the third year when using the ACPS

Due to relatively slow growth rates and low planting densities in conventional Florida citrus orchards, the trees only become economically productive in about the fifth year, and economic break-even occurs at 12-15 years. Clearly that scenario is unsustainable now that Huanglongbing (HLB) disease is endemic in Florida, and high HLB infection rates of new citrus plantings are frequently being reported by the second or third year. With advanced citrus production systems (ACPS) research incorporating elements of higher planting densities, precocious dwarfing rootstocks, and computerized open hydroponics techniques, it was shown that early economic production from years 2-3 is possible and economic break-even is expected from as early as 7-8 years. Reduced HLB symptom severity and incidence was measured by the fourth year in the intensively managed open hydroponics-grown trees and projections suggest that this high density orchard system may be sustainable despite advanced progression of HLB disease. The primary goals of ACPS orchard establishment experiments are to maximize early, efficient citrus production, to minimize HLB infections and to manage HLB-infected trees for continued partial production. Secondary objectives are to maximize profits by increasing water- and nutrient-use efficiencies, and to minimize environmental impacts such as nitrate leaching to groundwater. For additional information, contact Arnold Schumann at schumaw@ufl.edu. (web site: http://128.227.177.113/ACPS/Index.html)

Enhancing Phosphorus (P) Uptake by Lettuce on Muck Soils

In the Everglades Agricultural Area of south Florida, the pH of shallow muck soils increases through time due to soil oxidation and tillage, which exerts a negative effect on nutrient availability to crops, particularly for P and micronutrients. Elemental sulfur (S) is used as an amendment for these soils to decrease pH and increase nutrient availability to crops. Short-term decreases in soil pH and increases in P and micronutrient availability resulted from application of 250 lb elemental S/acre when banded in lettuce. Elemental S application reduced total P necessary for optimal lettuce yield by up to 30%. Broadcasted application of elemental S necessitated higher S application rates to achieve the same results. Reductions in total P inputs should help in reducing P discharges from fields into aquatic systems. For additional information, contact Alan Wright at alwr@ufl.edu.

SWSD faculty discussing fertilizer management for lettuce production

Evaluations of Best Management Practices for Crop Productions in South Florida

Adequate supplies of irrigation water and nutrients are required for optimal crop production on sandy soils. Demonstration projects are conducted in southwest Florida center around the use of nitrogen (N) and phosphorus (P) by the crop plants, movement of these vital nutrients within the soil, and their impact on water quality. Soil testing to correspond with crop nutrient demand are among the BMPs being evaluated. Controlled release fertilizers have been shown to improve citrus tree growth with reduced application costs and leaching. Recent demonstrations have shown that sugarcane yields can be maintained with one-third less nitrogen fertilizer. Similar work is being conducted on vegetable crops, with more controlled release fertilizers being used on those crops as well. A demonstration project in south Florida on soils with pH above 6.5 and high calcium content has shown the importance on maintaining the soil pH between 5.5 to 6.5. Phosphorus becomes less available at high pH so growers in some areas find it necessary to add P to their fertilizers even if the soil test indicates a high amount of P in the soil. Revised soil test recommendations are being determined for these soils and will aid the growers in applying the proper amount of P without increased impact on surface water quality. For additional information, contact Kelly Morgan at conserv@ufl.edu.

Strategies to Reduce Nitrate Loads to the Santa Fe River Watershed

Building a denitrification wall

The Santa Fe River in north central Florida has been identified as impaired due to elevated levels of nitrate. A survey of several tributaries in the Santa Fe River Watershed identified one significant source of nitrates to be a container nursery in the middle section of the watershed. Runoff from this area first infiltrates vertically through a surface layer of well drained sands then moves laterally on top of a clay aquitard eventually discharging to surface water through seeps. Nitrate leached through potted plants in the nursery during irrigation and rainfall events results in increased nitrate levels in the surficial aquifer and tributaries and eventually results in increased nitrates loads to the Santa Fe River. Extension activities include an evaluation and demonstration of container nursery Best Management Practices (BMPs) and a novel "denitrification wall" technology to decrease nitrate loads from the nursery and demonstrate how these practices can reduce nitrogen loads, while maintaining an economically viable nursery operation. Results indicate that enhanced cyclical irrigation techniques and reduced fertilizer application reduced nitrate sources by 78% and nitrate levels in the watershed downstream from the denitrification wall had nitrogen levels reduced by 65%. Amortization of treatment cost over a 15-year conservative life expectancy of the denitrification wall suggest that cost of nitrogen removal using this technique are around $0.79 per kilogram of nitrogen removed making it one of the lowest cost technologies to remove nitrate from surficial groundwater. For more information on the container nursery BMP demonstration project or denitrification walls, contact Mark Clark at clarkmw@ufl.edu.

Hendry County Sustainable Biofuels Center

CIC members receive a briefing regarding BPs efforts to produce biofuel crops more efficiently. Photo credit: Dr. N. Amponsah

This 2-year project funded by the US Department of Energy through the Hendry County Board of County Commissioners to the University of Florida. The biofuels project combines Life Cycle Assessment and Emergy approaches with economic components to develop decision-making tools to be used by elected officials and agencies to evaluate biofuels practices and proposals, not only for the short term but in a long-term, sustainable approach. The use of energy components is also leading to alternative farming systems approaches to improve sustainability, some components of which are being evaluated by researchers at the Everglades Research and Extension Center (REC) and the Southwest Florida REC. The second goal of the biofuels project is to produce technically trained field and laboratory professionals through curriculum development using biofuels to create a 2-year degree from Edison State College and use the 2-+2 program to obtain a Bachelor's of Science at the University of Florida. A youth development component addresses the sixth grade through 12th grade and involves teacher trainings that are compatible with the State and County standards. The fourth goal is to involve the community in the biofuels center, which includes the Community Involvement Committee (CIC). A wide cross-section of southern Florida was invited to participate in the CIC so that ideas, approaches, and findings are presented and discussed in this public venue.There are 10 state and county extension faculty members (UF-main campus, SWFREC, EREC, and TREC) and two sub-contractors involved in this project, focused mainly in southern Florida. For additional information, contact Ed Hanlon at eahanlon@ufl.edu.

Water Quality Sampling and Monitoring Education

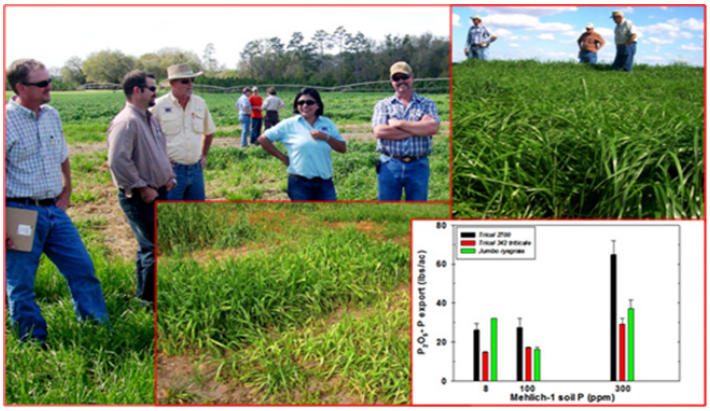
In collaboration with county extension agents and state specialists, Yuncong Li, Kati Migliaccio, Ed Hanlon and others organized a two-day In- Service Training on "Water Quality Sampling and Monitoring Technology" for extension agents in 2006 and 2008, a one-day and a five-day training program for environmentalists (from SFMW, FDEP, NOAA, UM, etc.) in 2007 and 2008, one-day program for local college teachers and students in 2009, and a 5-day training program for IFAS state faculty in 2011. The program included hands-on experiences of water sampling and water quality analysis in the laboratory using various methods and instruments. Pre- and post-tests showed the knowledge increase was 28% in 2007, 73% in 2008, and 24% in 2011 (In lecture series, a typical number for knowledge gained is usually in the 9% range). It appears that lectures, hands-on experiences, and ample discussion time helped considerably with knowledge gain by the participants. One of participants wrote: "Congratulations on an outstanding job of organizing the Extension Water Quality In-service Training. This was one of the best I have attended in recent years… demonstrated through the classroom lectures, field sampling, tour of pump stations and Everglades National Park, airboat collecting trip, and finally the great water analysis lab sessions. Even some of us old hands learned new things." Based on on-site workshops, Li and Migliaccio developed an on-line water quality training workshop which is available to extension agents, environmental professors and researchers. Since it opened for registration in April this year, more than 20 participants registered the workshop and 12 of them have received their certificates. They also published the book of "Water Quality Concept, Sampling and Analyses" which is available in e-book format at the UF library and the book was also translated into Arabic recently. For additional information, contact Yuncong Li at yunli@ufl.edu.

Certified Crop Advisor Semi-annual Training

A panel discussion with Certified Crop Advisors on Agricultural BMP Issues at Lake Alfred- at the table, left to right: Mace Bauer and Jemy Hinton, IFAS BMP Implementation Team; Pete Deal, USDA-NRCS; Dr. Mike Thomas, FDEP; Bill Bartnick, FDACS, and Rao Mylavarapu, Moderator, UF-IFAS. Remote 2-way video link provided to Immokalee, Baum, Tavares, Ft. Pierce, and Gainesville. Photo credit: Dr. Y. Newman

The Certified Crop Advisor (CCA) program got its start in 1994 with Andy LaVigne, then President of the Florida Fertilizer and Agrochemical Association (FFAA) and Ed Hanlon. The current active UF program team includes Tom Obreza, Rao Mylavarapu, Yoana Newman, and Ed Hanlon working with Mary Hartney, FFAA President. The Florida CCA Program has a statewide steering committee composed of CCAs, UF faculty, and an NRCS representative. The CCAs within Florida number approximately 180. This population number shows remarkably small changes with time, even with the dynamic nature of the agricultural industry. The program team along with CREC staff and staff located at five other UF locations provide 10 hours of continuing education units (CEUs) semi-annually using several electronic systems including Polycom. Five CEUs in each of the four competency areas (soil and water management, nutrient management, IPM, and crop management) are offered yearly. Topics are presented in 1-hour segments by UF state and county faculty members and usually one guest speaker from outside of the state. The entire CCA population within Florida is surveyed every few years to ensure that the semi-annual training is both modern and relevant to Florida's agriculture. Pre/post knowledge gained instruments have been used since 2004 and focus on actual content questions. The range of knowledge gained extends from 9% to more than 30%. Typically, the content and resulting pre/post questions result in the pre-tests having scores of 70 to 80%, which means that the speakers slightly underestimate the informed knowledge base of our well-trained Florida CCAs. For additional information, contact Ed Hanlon at eahanlon@ufl.edu.

The Forage Factor: Increasing Farm Phosphorus Exports



As of 2010, there were over 9.2 million acres of farmland in Florida, including 1.6 million cattle and 0.1 million dairy cows. The challenge is to produce quality, high-yielding forage for these livestock, while protecting the environment. Among cool-season forages, annual ryegrass had traditionally been the best choice for high yields and nutrient export through silage and hay removal. Over the past few years, we have introduced triticale to dairies and cattle ranches throughout the state. Early maturing triticale forage cultivars capture more soil phosphorus (P) during the winter season than annual ryegrass, in part, because forage production peaks earlier for triticale. By blending triticale and ryegrass, we can extend the silage season (triticale early-maturing and ryegrass late-maturing), thereby increasing total season tonnage and P export. Additionally, blends appear to have greater cold tolerance than when grown as monocultures (see bottom photo inset). Our extension efforts have attracted the attention of farmers and ranchers throughout the tri-state area. This is well-reflected by an increase in triticale plantings from zero acres in 2009 to a projected 45,000 acres in 2012. Better forage species and management choices are resulting in an additional farm export of 10 to 20 lbs P_2O_5 per acre, or approximately 450 tons annually. With increasing acreage converting into triticale, P exports will likely continue to increase. County extension faculty have been an integral part of this project by disseminating research results to the producer through annual on-farm demonstrations and field days. For additional information, contact Cheryl Mackowiak at echo13@ufl.edu.

Teaching Homeowners and Landscape Management Professionals about Nitrogen and Irrigation Management of Turfgrass

Funding from a USDA Specialty Crops Block Grant through the Florida Turfgrass Association is being used to conduct research and educational programs on nitrogen (N) and irrigation management in urban turfgrass systems. This is a SWSD led project with faculty from Environmental Horticulture and Agricultural and Biological Engineering. Building on the research component, educational programs and demonstrations have been developed.

A water-soluble blue marking dye (see blue coloration of turf near the plot stakes) was applied to several areas in the lawn, and then irrigated for various lengths of time. The plastic tarp was used to protect the dyed areas not requiring a particular irrigation. Insert: The blue dye showed that water moved deeper in the sandy soil (right) compared with the clay soil (left), (If excessive water was applied, especially to the sandy soil, then the dye moved below the root zone)

Educational programs: Three comprehensive turfgrass management symposia were presented in three locations in the state this summer: Tallahassee, Kissimmee, and Ft. Lauderdale. The full-day programs focused on the integration of turfgrass management practices and nutrient management including how irrigation management would affect fertilization practices and nutrient losses from the landscape. Speakers also addressed nutrient management and its impact on turfgrass insects and diseases. These educational programs targeted lawn care professionals, government decision-makers (environmental issues), and educators. From the first program in Tallahassee in June, basic participant knowledge about urban nutrient and water management increased 24% due to the educational program.

Community demonstration: We have carried out one demonstration program in a community, Mentone, in Gainesville. This demonstration involved a combination of an educational meeting with the community residents and a demonstration of water movement in urban soils. This demonstration was carried out with assistance from Alachua County Extension and the IFAS Florida-Friendly Landscaping program. A one-hour presentation and discussion was held on Saturday, May 5th to teach the residents how irrigation management is important for keeping N in the root zone and preventing its loss to the environment. A demonstration using a water-soluble blue dye was conducted to show how N moves in the soils with the irrigation water. The take-home lesson was that mismanaged and excessive irrigation leaches N below the root zone and into the groundwater. For additional information, contact George Hochmuth at hoch@ufl.edu.

Reducing Phosphorus Loads from the Everglades Agricultural Area

A BMP Training Workshop in session at the EREC

As required by the Everglades Forever Act, a mandatory Best Management Practices (BMP) program was initiated in 1995 on all Everglades Agricultural Area (EAA) farms in south Florida to reduce phosphorus (P) loads from farm drainage water and the negative impact on the downstream Everglades ecosystem. Our program has been developing, testing and assisting farmers to implement BMPs to achieve the mandated 25% P load reduction required by law. The program focuses on improving the quality of drainage water exiting EAA farms through ongoing BMP research as well as extension activities including BMP training workshops offered twice yearly to farm personnel, water managers, and extension specialists. The main BMP areas that the program has focused on include P fertilizer application controls, rainfall detention methods, and particulate and sediment controls. The EAA basin P annual load reduction has averaged 54% since the BMP program's inception. A record 79% reduction was achieved in 2011, attesting to the success of the partnership between the EAA growers and University personnel. Currently the Water Quality Group at EREC is in the third year of a five year project involving eight EAA farms; the project is investigating the influence of floating aquatic vegetation on farm canal sediment formation and P loads. For additional information, contact Samira Daroub at sdaroub@ufl.edu.

Model analysis of Everglades restoration scenarios

The regional domain of the Everglades Landscape Model (ELM), including the domain of the water management model (SFWMM) used in the project

Understanding and synthesis of integrated hydrologic, water quality, and ecological interactions in large landscapes across multiple decades is critical. Our primary emphasis has been the Everglades Landscape Model (ELM), with a regional version that encompasses a wetland region almost the size of Connecticut. Our program involves the application of computer models to support Federal, State, and County agencies in their management and restoration of landscapes, with an emphasis on the >10 billion dollar Comprehensive Everglades Restoration Plan (CERP).
A recent application example was the evaluation of water quality constraints on a critical CERP project nicknamed "Decomp", which is considered to be the "heart" of Everglades restoration planning. For this (2011-2012) project, we simulated and analyzed nine management scenarios, involving numerous meetings with project team members from Federal, State, and County agencies - to gain a consensus on the modeling methods and interpretation of results. In this first use of an ecological model to assess water quality risk in CERP planning, the Decomp multi-agency team concluded that the proposed hydrologic restoration plans did not adversely impact water quality in the Everglades.

Movement forward on the Decomp project is a vital step towards the multi-decadal plan to restore the Everglades. Moreover, the National Research Council's most recent report on CERP progress reiterated the importance of applying integrated ecological models, which had been missing from the Everglades analyses. Among other positive comments, they stated that "*The recent use of ELM in the Decomp planning process is a promising step forward*." For additional information, contact Carl Fitz at cfitz@ufl.edu.

Welcome Incoming Students Fall 2012 !

PhD

Carla Gavilan (Grunwald)
Andree George (Teplitski)
Marcos Moraes (Teplitski & Hochmuth)
Jose Yaquian Luna (Jawitz)
Yiming Xu (Grunwald) -SNRE-ECL

MS

Amy Boone (Li)
David Bright (O'Connor)
MJ Carnevale (Osborne)
Eva Christensen (Hochmuth)
Amber Daigneault (Mackowiak)
Amanda Desormeaux (Hochmuth) -SNRE-ECL
Yu Fang (Jawitz)-SNRE-ECL
Cynthia Gates (Clark)
Jay Hoecker (Stanley)
Paul Kirk (Ma)
Elise Morrison (Ogram & Turner)
Tiffany Petersen (Daroub)
Beth Robertson (Osborne)
David Rossignol (Osborne)
Alexandra Rozin (Clark)
Stacey Travis (Toor)
James Young (Teplitski)

BS

Zachariah Barber (Curry)
Daniel Rutherford (Curry)
Autumn Sporleder (Curry)
Ashley Witkowski (Curry)

Soil & Nutrient Management for Sustainable Forage Production

Beef cattle production represents an important part of Florida's agriculture. The beef industry consists predominantly of forage-based cow-calf systems that rely on pastures as the major source of energy and protein. Currently, Florida has about 3 million hectares of pasture and rangeland, of which about 2 million hectares are planted pastures. Due to the extensive area and potential impacts associated with nutrient transport, environmentally sound pasture fertilization program is critical to maintaining Florida's forage and beef cattle industry as well as preserving the environment. As urban areas in the state continue to expand, beef cattle operations play an important role in maintaining both water quantity and quality. Pasture and rangelands can also serve as important means of controlling flooding and aid in maintaining underground water supply for urban areas. For more information, contact Maria Silveira at mlas@ufl.edu.

Faculty, Staff, and Students

Congratulations to our Faculty and Students ….

Alan Wright has been elected chair of Wetland Soil Division (S10) of the Soil Science Society of America.

Rao Mylavarapu is the incoming Chair of the Soil & Plant Analysis Council (2012-2014), a Soil Science Society of America sponsored group. He will be co-organizing the 13th Symposium of the International Soil & Plant Analysis Council with the Australasian Soil & Plant Analysis Council in Queenstown, New Zealand from April 8-12, 2013 (www.isspa2013.com).

Congratulations to **Samira Daroub**, Everglades Research and Education Center, for her selection as a NACTA (North American Colleges and Teachers in Agriculture) Teacher Fellow. Samira was recognized for this honor during 2012 NACTA Conference held at the University of Wisconsin, River Falls, WI.

Julius Adewopo – Graduate Student Council Award for Best Graduate Student Organizer.

Ryan Graunke, graduate student in Interdisciplinary Ecology/SNRE (Advisor, Ann Wilke) received the 2011 IFAS Award of Excellence for Graduate Research - Best Masters Thesis.

Jared Sweat graduated with an MS degree this summer in spite of cancer. http://news.ufl.edu/2012/08/02/uf-graduate-summer/

The Mayor's Council was recognized recently for its valuable contribution to the University of Florida from among eight graduate campus organizations. **Julius Adewopo**, SWSD graduate student and President of the Mayor's Council says, "Our core mission is to *promote* community-style living experience in the Graduate Family Housing villages, *enhance* socio-cultural exchange within the University community, and to *facilitate* the availability of infrastructural resources for the residents.

Congratulations! Summer 2012 Graduates

PhD

Subodh Acharya (Mylavarapu)
Lisa Gardner Chambers (Reddy)
Davie Kadyampakeni (Morgan & Nkedi-Kizza)
Jason Lessl (Ma & Teplitski)
Xiaolin Liao (P. Inglett)
Cassandra Medvedeff (P. Inglett)
Augustine Muwamba (Morgan & Nkedi-Kizza)
Kiara Winans (Reddy & Hanlon)

MS

Karen Balentine (Ellis)
Christine Coffin (Li)
Jorge Guevara (Ellis)
Drew McLean (Shober & Ellis)
Jason Neumann (Clark)
Thomas Chad Ponce (Osborne)
Megan Smith (Graham & Ogram)
Aja Stoppe (Comerford)
Jared Sweat (Collins)

BS

Devin Leonard (SLS – WS; Bonczek)
William Beaver (IS-EMANR; Curry)
Sara Wynn (IS-EMANR; Curry)
Wendy Yuen (IS-EMANR; Curry)

Extension Soil Testing Program, since 1959

Free soil pH tests and tours were provided to all the visitors at the Extension Soil Testing Lab Open House

The Extension Soil Testing Program has been in operation for over 50 years, is one of the oldest and largest educational programs offered by IFAS, and is housed in the Soil & Water Science Department. Nearly 17,000 samples were analyzed and reports were sent to producers and homeowners in the state during FY2011-12. Over 200,000 acres of cropped area in the state has been impacted by the nutrient guidelines provided and thus reducing unnecessary applications of an estimated 17.5 million pounds of N-P-K fertilizers together and minimizing any potential soil and water quality impacts during the year. An Open House was conducted at the Extension Soil Testing lab in Gainesville in April, 2012, where free soil pH determinations were provided to general public along with guidance and answers to questions on nutrients, fertilizers, water, pests and disease management by IFAS specialists drawing producers and homeowners from five different counties. For more information on soil, water and tissue testing, IFAS nutrient recommendations, contact Rao Mylavarapu at raom@ufl.edu.