

Southwest Florida
Research and
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INSIDE THIS ISSUE:

Field Day Report 2

Spotlight On... 3

Latest Research 4

Staff News 6

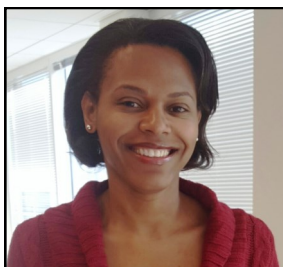
New Faculty Intros 7

Coming Events 8

Center Director's Corner

As 2016 comes to a close, I am pleased to report that we have added two new faculty members at the center. Dr. Ozgur Batuman started at the SWFREC in early October as our new Citrus Plant Pathologist. And Dr. Ramdas Kanissery started at the center in late October as our new Weed Scientist. You can read introductions of both new faculty members on page 7 of this newsletter.

Dr. Tara Wade has accepted the newly created SWFREC faculty position of Agricultural/Resource Economist. She earned her Ph.D. in energy and environmental systems and economics from North Carolina Agricultural and Technical State University in Greensboro and currently works as a post-doctoral research associate



at the United States Department of Agriculture Economic Research Service in Washington, DC. Dr. Wade is expected to start at the Center in April of next year.

Interviews have just been completed for the SWFREC Citrus Horticulturist faculty position. UF/IFAS administration will be announcing shortly the successful candidate.

The search is underway for the new Precision Agricultural Engineer faculty position. The application process has officially closed, and

three top candidates are presently being selected for interviews.

Future facility-related goals at the SWFREC include the construction of four new greenhouses (for the soil microbiology, citrus pathology, plant physiology, and weed science programs) as well as a full renovation of the farm, including complete automation of our pumping system.

On behalf of the entire SWFREC faculty and staff, please allow me to wish you and yours happy holidays and hope for a prosperous new year!

Calvin Arnold

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Field Day Features Research Trials

Dismal afternoon skies didn't deter nearly sixty growers and other industry representatives from participating in the SWFREC 2016 Fall Vegetable Field Day on December 1.

As rain made way for a late-afternoon sunset, in-field research trials highlighted during the event included:

- ◆ Agricultural Engineering, Dr. Sanjay Shukla—“Water Management for Compact Bed Geometry”
- ◆ Entomology, Dr. Phil Stansly and senior biological scientist Barry Kostyk—“Effect of Metalized UV Reflective Mulch on Pepper Pests” and “Biological Control of Whiteflies on Tomato with Predaceous Plant Bugs”
- ◆ Vegetable Horticulture, Dr. Monica Ozores-Hampton and graduate student Gilma Castillo—“Nimitz Movement Using Seepage Irrigation in Tomato Production,” “Soil Symphony (Microbial Fumigation) and Anaerobic Soil Disinfestation in Tomato Production (with Dr. Erin Roskopf and Dr. Francesco Di Gioia, USDA-ARS, Fort Pierce), and “Yield Estimation of Aji Dulce in South Florida”
- ◆ Soil and Water Science, Dr. Kelly Morgan and graduate student Timothy Ayankojo—“Smartphone App Improves Water and Nutrient Efficiency”

The indoor presentation

featured additional information about Dr. Shukla's bed geometry project, “Economic, Environmental, and Disease Aspects of Compact Bed Geometries for Double-Row Crops.” Additional SWFREC speakers included graduate student Kira Hansen and soil microbiologist Dr. Sarah Strauss. Dr. Joe Noling with the UF/IFAS Citrus Research and Education Center in Lake Alfred also spoke about the project.

Sponsors for the research trials featured at the field day included: DuPont, Syngenta, Certis, Dow, TriEst Ag Group, Inc., Helena, and IQV.

Dinner generously was sponsored by Sonya Carns, Ag-Tronix.





The vegetable field day enables graduate students to present their research trials and allows time for growers to talk future projects with SWFREC faculty members.

Spotlight On . . . SW FL Citrus Production

Hendry County has become the state's top citrus-producing county.

According to the USDA's 2015-16 statistics, Hendry is number one at 14 million-plus total boxes. Two other counties in SW Florida are in the top ten: Collier at seven (6.5 million-plus boxes) and Charlotte at ten (2.6 million-plus boxes).

"The team efforts of citrus

growers in Florida's Gulf production region are truly paying off," says Ron Hamel, executive vice-president of the Gulf Citrus Growers Association.

"Working with the UF/IFAS SWFREC scientists and FDACS DPI staff, the region's growers are implementing positive programs to reduce the impacts of greening on their crop production."

Adds SWFREC Agricultural Economist Dr. Fritz Roka:

"Growers have partnered with SWFREC researchers to develop innovative strategies to mitigate against greening's adverse effects, including the state's first CHMA, nutritional foliar feeding, recognizing the value of compost soil amendments, and the importance of maintaining good water quality control."

Foundation Supports SWFREC Mission

The Southwest Florida Research and Education Foundation (SWFREF) is a direct support organization of the SWFREC. Its official mission is: "To further the education, research, and service mission and

goals of the University of Florida by providing research and educational support to the SWFREC."

Officers elected to serve the SWFREF for 2017 are:

- ◆ Joby Sherrod, President
- ◆ Jaime Weisinger, Vice-President
- ◆ Mike Taylor, Treasurer
- ◆ Charles Lucas, Secretary

Latest SWFREC Research

Biostimulants for Citrus and Vegetables

Dr. Ute Albrecht, Plant Physiologist

In the past, vegetable production in the United States and other countries has largely relied on use of the broad-spectrum fumigant methyl bromide, which, because of its negative impact on the environment, has now been phased out. Although new chemical

alternatives are being investigated, non-chemical alternative strategies are desirable for more sustainable crop production.

In citrus, the devastating disease Huanglongbing has spread throughout Florida since its discovery in 2005, and management practices include increasing the amounts of insecticides to combat the disease vector in

combination with enhanced nutritional applications. Recent years have seen an

explosion of non-chemical plant production products termed “biostimulants” as alternatives to chemical formulations and methods to enhance the sustainability of agricultural production systems. However, much confusion exists as to the meaning of this term. Many different definitions for biostimulants have been proposed, many geared toward their acceptance by future regulations, especially in the EU, and attempting to draw the line between biostimulants and fertilizers, pesticides, or biocontrol agents. According to the North American Biostimulant Coalition 2013, biostimulants are defined as “substances including microorganisms that are applied to plant, seed, soil, or other growing media that may enhance the plant’s ability to assimilate applied nutrients, or provide benefits to plant development. Biostimulants are not plant nutrients and therefore

may not make any nutrient claims or guarantees.”

By this definition, biostimulants have no direct action against pests and, therefore, do not fall within the regulatory framework of pesticides. However, some biostimulants can have a dual function of biostimulant and biocontrol agent. Hence, the regulatory framework is still nebulous, and biostimulants are often marketed as fertilizers in mixture with nutritionals.

Biostimulants are available in many formulations and with varying ingredients. The most popular ingredients include beneficial bacteria, beneficial fungi, humic substances (humic and fulvic acids), and seaweed extracts. Other products may contain chitosans (a soluble version of chitin), protein hydrolysates, and inorganic compounds such as silicon. For many years, these substances were considered to be “snake oils” or substances of mysterious



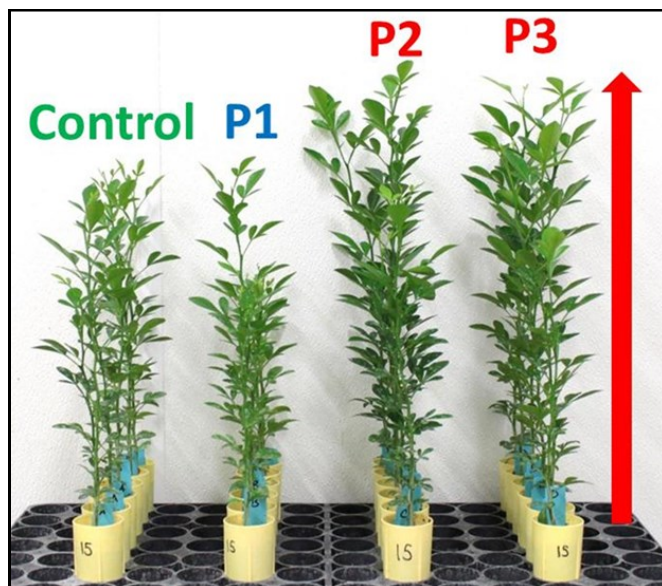
Applying beneficial fungi to a young citrus tree.

origin which promise to perform miracles. But a large number of studies have shown that many crop systems respond to these substances with higher productivity and improved tolerance to biotic and abiotic stresses and demonstrated a scientific base for the observed effects, although the exact mechanisms of action were not always understood. Effects of biostimulants include improvement of soil physiochemical properties, improvement of water and nutrient uptake, improvement of water and nutrient use efficiency, improvement of root architecture, enhanced tolerance to diseases and unfavorable environmental conditions, and improved fruit quality

and yield. Although biostimulants were initially used in organic production systems, consumer demands for more sustainable crop production have resulted in increasing popularity among conventional growers. Part of the plant physiology program is dedicated to investigating the effects of different biostimulant substances on plant growth and tolerance to pest and diseases and their suitability for agricultural production systems. Several field trials including citrus and vegetables have been initiated. Since field trials are laborious and take a long time to yield meaningful results, especially in tree crop systems such as citrus, strategies are explored to investigate

the efficacy of formulations more quickly and under greenhouse conditions. Our initial studies on citrus greenhouse seedlings and young citrus plantings show promising effects on plant growth and vigor in response to formulations that are composed of beneficial soil microbes

Collecting and/or
tomato plant, humic
soil samples. substanc-



Effects of different biostimulant formulations on citrus rootstock seedlings in a greenhouse experiment. Product P2 contains an assortment of beneficial soil microbes. Product P3 is composed of humic acid and seaweed.

es. We are currently investigating the physiological responses of roots collected from these experiments as well as the composition of the root-soil microbiome in collaboration with SWFREC Soil Microbiologist Dr. Sarah Strauss. The results from these studies will allow us to select formulations that are most likely to have a positive impact on plant production.

For more information, contact Dr. Albrecht at ualbrecht@ufl.edu.

Staff News

- ◆ Soil Microbiologist Dr. Sarah Strauss partici-



pated in the 17th Annual UF/IFAS Soil and Water Sciences Research Forum in Gainesville in September. Her New Faculty Oral Presentation was titled “Taking Steps to Understand and Manage the Soil Microbial Communities of Citrus.” Dr. Strauss also recently was recognized as a UF/IFAS Early Career Scientist Seed Fund program award winner. Created by the UF/IFAS Dean for Research office, the honor is designed to facilitate development of new faculty research, jumpstart their research programs, and provide a platform for their future success. Dr. Strauss’ proposal was titled “Impact of Propagation Method

on Citrus Rhizosphere Development.” She received a monetary award for her program of \$40,100.

- ◆ Three SWFREC graduate students recently participated in career day events at Immokalee schools. Entomology master’s student Nicholas Johnston shared his personal bug collection with students at Highlands Elementary School in October. He gave three twenty-minute presentations to third-grade students and spoke about “becoming a scientist.” Johnston’s graduate committee chair is SWFREC Entomologist Dr. Phil Stansly. Vegetable horticulture master’s student Gilma Castillo and agricultural and biological engineering master’s student Max Wallace participated in a career day for third-, fourth-, and fifth-graders at Lake Trafford Elementary School in November. Castillo, originally from Honduras, spoke about her experience as an undergrad and graduate student at UF—both in

the classroom setting on campus in Gainesville and in the field conducting research trials at the SWFREC. She is a student under SWFREC Vegetable Horticulturist Dr. Monica Ozores-Hampton. Wallace spoke to the students about his graduate research project, the restoration of Immokalee’s Lake Trafford, as well as his experience as a UF graduate student and his interest in water resources engi-



neering. He is a student under Agricultural and Biological Scientist Dr. Sanjay Shukla.

- ◆ Wallace’s poster at the 2016 national meeting of the American Society of Agricultural and Biological Engineers last summer in Orlando earned a top-poster award. The recognition also included a \$250 cash prize.

Introducing New SWFREC Faculty

The SWFREC is pleased to welcome two new faculty members!

Citrus Pathologist Dr. Ozgur Batuman began at the center in early October. Before coming to the SWFREC, he was a project scientist in the Department



of Plant Pathology at the University of California-Davis. There he worked on thrips population dynamics and *Tomato spotted wilt virus* (TSWV) incidence in processing tomatoes, peppers, and lettuces in Central California for development and implementation of an integrated pest management strategy for TSWV/thrips control. He was also involved in identification and characterization of virus and virus-like diseases of other vegetable crops.

Dr. Batuman received his master's in plant pathology from the University of Cukurova,

Turkey, and his Ph.D. in plant pathology from the Hebrew University of Jerusalem, Israel. His graduate studies primarily dealt with *Agrobacterium*-mediated genetic transformation of citrus and model plants with various genes of *Citrus tristeza virus*.

Dr. Batuman's research program at SWFREC will be focused on better understanding of pathogens causing economically important diseases in citrus and the development of effective, long-lasting, and integrated pest management strategies for controlling citrus pathogens that currently threaten the industry in Florida. His program will further expand toward basic aspects of research. If, for example, understanding of the biology of a certain pathogen is lacking, he will study pathogen biology, epidemiology, and pathogen-vector-citrus interactions.

Weed Scientist Dr. Ramdas Kanissery began at the SWFREC in late October. He previously worked as a senior chemist with EAG Laboratories, an environmental fate research and consulting organization based in Easton, Maryland.

Dr. Kanissery received his master's degree in agricultural chemicals from the Indian Agricultural Research Institute in New Delhi. He earned his

Ph.D. in natural resources and environmental sciences from the University of Illinois at Urbana Champaign.

Dr. Kanissery's previous research explored the knowledge gap in the fate and degradation of herbicides in soils enduring different environmental conditions. He utilized such approaches as radiochromatography and kinetic evaluation to study the influence of soil factors such as aeration, soil amendments, and mineralogy on the persistence and mobility of extensively used herbicides in corn-soybean rotations from the US Midwest.

Dr. Kanissery's SWFREC research and extension programs will focus on the weed control and herbicide use associated with citrus and vegetable production in South Florida.

He plans to elucidate the mechanisms involved in the functional efficacy, retention, and transport of herbicides used in Florida agriculture soils with particular emphasis on excessively drained sandy soils and sandy soil textures in combination with high water tables.

Welcome, Dr. Batuman and Dr. Kanissery!



Coming Events

January 19: *Fungal Diseases of Citrus Seminar.* 10am-1pm, SWFREC, Immokalee. More information to come at <http://swfrec.ifas.ufl.edu/about-us/calendar/>.

February 1: *Certified Pile Burner Course.* 8:30am-4pm, SWFREC, Immokalee. \$50 registration fee. For more information and to register, contact Mongi Zekri, Hendry County Extension office: 863-674-4092.

February 8: *Pests of Citrus Seminar.* 10am-1pm, SWFREC, Immokalee. More information

to come at <http://swfrec.ifas.ufl.edu/about-us/calendar/>.

February 8: *Big Red Bus.* 10am-2:30pm, SWFREC, Immokalee. Donate blood and receive a free wellness check and a nominal prize.

February 22 / 23: *Food Safety Workshops.* 8am-5pm, SWFREC, Immokalee. More information to come.



SWFREC hosted the annual UF/IFAS Farm Managers Meeting in early December. Seventeen managers participated in the event, which included a field tour at Pacific Tomato near Immokalee.