UF | IFAS Extension
UNIVERSITY of FLORIDA

REPORT

of

In-Service Training (IST#: 31438), FDACS Program (#24721) and CCA Programs (FL 53103)

New Technology for Commercial Crop Production (V)

Meeting ID: 480 115 633
Wednesday, February 28, 2018
Zoom from 1308 Fifield Hall to 12 registered host sites statewide


Dr. Carrie L. Harmon


Dr. Ross Welch
Cornell University


Dr. Dario Charvez
University of Georgia

Disease update from the UF-IFAS Plant Diagnostic Center: horticultural samples in 2017

The evolution of weed management in vegetable production systems

Using agriculture as a tool for better health

Alternative Specialty Crops in Florida: Opportunities and Challenges

Peach production and what we have learned

New technology in postharvest plastics


Dr . Nathan Boyd


Dr. Shinsuke Agehara


Dr. Jeffrey Brecht

G. David Liu, Fred Fishel, and Kelly Morgan

Horticultural Sciences, Agronomy, and Soil and Water Science Departments

Tuesday, March 20, 2018

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New Technology for Commercial Crop Production (VI)

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New concepts and/or new techniques have been developed to help growers make right decisions for crop production. These new techniques improve the profitability and sustainability of Florida's crop production and help enhance use efficiency of natural resources such as water and fertilizers. To provide an opportunity for our extension agents and graduate students to learn these new techniques, two out-state and four UF/IFAS extension specialists were invited to share their recent work at the New Technology for Commercial Crop Production (VI) IST training on February 22, 2017.

The objective of this IST training was to introduce new concepts and techniques to our extension agents, crop certified advisors, and graduate students for saving labor and enhancing the economic and environmental sustainability for commercial crop production in Florida.

This program will have six specialists to present. The presentations cover plant disease diagnosis, plant nutrition and human health, new specialty crops, peach production, and new technology in postharvest plastics.

Presentation Description

Title: Disease update from the UF-IFAS Plant Diagnostic Center: horticultural samples in 2017.
Specialist: Dr. Carrie L. Harmon, University of Florida
Description: Plant samples of all kinds come to the UF-IFAS Plant Diagnostic Center for disease analysis. We will discuss the types of samples we received in 2017, some new diseases to watch for in fruit and vegetable production, where to find relevant disease management recommendations, and a few best practices to reduce disease pressure in your system.

Title: The evolution of weed management in vegetable production systems
Specialist: Dr. Nathan S. Boyd, University of Florida
Description: Weed management in vegetables is undergoing a transformation. Growers across the Southeast traditionally relied on methyl bromide for weed control with herbicides applied between the raised beds. Over the past ten years the number of herbicide applications and the number of herbicide types applied in vegetable crops has increased due in large part to the loss of methyl bromide. At the same time, growers have improved fallow management and adopted more diverse weed management practices. The rapid advances in precision agriculture and robotics over the past few years will most

likely completely transform weed management practices and will be the next major transition. Weed management in the future is likely to look very different than it does today.

Title: Using Agriculture As A Tool For Better Health
Specialist: Dr. Ross Welch, Cornell University
Description: Because agricultural products are the primary source of all micronutrients, agricultural practices and policies have the potential to either exacerbate or prevent human micronutrient malnutrition on a global scale. A healthy agricultural industry is crucial for providing nutrients to human populations. Soil quality and soil fertility have a direct influence on the nutrient content of food crops. Soil improvements can increase productivity and allow for greater diversity of crops without increasing the area cultivated. Agricultural tools such as micronutrient-enriched fertilizers and farming systems designed to meet nutritional needs should be used as sustainable strategies to reduce micronutrient malnutrition. Plant breeders should include nutritional quality traits as well as yield traits as targets for enhancement when breeding for improved crop varieties. Biofortification is a new strategy that has great potential to help reduce the burden of micronutrient malnutrition globally especially in resource-poor families in rural areas. Clearly, agriculture must be closely linked to human nutrition and health if we are going to find sustainable solution to micronutrient malnutrition globally.

Title: Alternative Specialty Crops in Florida: Opportunities and Challenges
Specialist: Dr. Shinsuke Agehara, University of Florida
Description: Alternative crops have the potential to provide additional markets and greater profitability compared with traditional specialty crops. We are currently evaluating the potential of artichoke, blackberry, pomegranate, and hop, as alternative crops in Florida. Attractiveness of these crops include high nutritional values and antioxidant content, increasing consumption, premium prices, and demands for locally-grown produce. However, Florida's subtropical climates provide many constrains, such as conditions conducive to disease development and insufficient chill hours and photoperiod. This presentation will discuss the strategies to overcome these challenges.

Title: Peach production and what we have learned
Specialist: Dr. Dario Chavez, University of Georgia
Description: The presentation will touch on current technologies being tested in peach production in Georgia and in the Southeastern U.S. Among the techniques, studies will be presented comparing the use of beneficial nematodes for the control of borers in comparison to chemical standards. Similarly, the use of plant growth regulators to delay fruit ripening and increase fruit firmness.

Title: New technology in postharvest plastics
Specialist: Dr. Jeffrey Brecht, University of Florida
Description: Plastics are ubiquitous in the postharvest arena as bulk containers for harvest and transport, and especially as consumer packages. Concern about reducing plastic waste has led to innovations in recyclable, biodegradable and compostable plastics for postharvest uses. Plastic packages are widely used and critical for extending produce

shelf life. Modified atmosphere packaging (MAP) regulates transmission of respiratory gases to achieve low O2 plus high CO2 atmospheres that slow produce metabolism. MAP and other smart packages supplement temperature control and are obligatory for successful marketing of many fresh-cuts and other highly perishable horticultural products.

Speakers' BioSketch

Dr. Carrie L. Harmon is the director of the UF-IFAS Plant Diagnostic Center and the Associate Director of the Southern Plant Diagnostic Network. She joined the faculty of the UF-IFAS Plant Pathology Department in 2003 with a BS in Plant and Soil Sciences from UMass, Amherst; an MS in Plant Pathology from Purdue University; and a Plant Pathology PhD from UF. She has worked in plant disease diagnosis for 15 years, and her focus is on extension plant pathology, detection of diseases, diagnostic method improvement, and dissemination of detection, diagnosis, and management information via the diagnostic network and her laboratory.

Dr. Nathan S. Boyd, associate professor of weed science at the University of Florida. Since arriving at the University of Florida Dr. Boyd has studied integrated weed management in vegetables, strawberries, and small fruit crops. He emphasizes a cropping systems approach that integrates cover crops, fumigants, and herbicides. In recent years he has focused on precision agriculture. Dr. Boyd has published many peer reviewed papers, articles, and book chapters on weed management.

Dr. Ross Welch is a Professor (Courtesy) of Plant Nutrition in the Section of Soil and Crop Sciences, School of Integrative Plant Science at Cornell University. Much of his research career was focused on micronutrient malnutrition in humans and in finding ways to improve the micronutrient nutritional quality of major staple food crops. He was instrumental in founding the concept of biofortification and in helping to develop a global program (HarvestPlus) that is currently delivering micronutrient-rich staple food crops in Asia, Africa, South America, Central America and Mexico. He was inducted into the Science Hall of Fame by USDA-ARS in 2014 and is a Fellow of the American Society of Agronomy and the Soil Science Society of America.

Dr. Shinsuke Agehara, assistant professor in plant physiology at University of Florida, Gulf Coast Research and Education Center. His research focus is on understanding plant physiological and morphological adaptation mechanisms to environmental stresses, and developing integrated sustainable management strategies for vegetable and small fruit crops. He serves on several Working Groups for the American Society of Horticultural Science and on the editorial board of International Journal of Plant Science and Agriculture.

Dr. Dario Chavez is the Peach Research and Extension Specialist for the state of Georgia. He is originally from Ecuador, and he attained a BS in Agriculture Sciences and Production in Zamorano, Honduras. Dr. Chavez obtained his MS and PhD in Horticulture working with blueberries, citrus, peaches, and plums at the University of Florida. His

main area of interest at UGA is peach focus on orchard management, tree longevity, irrigation practices, root interaction with tree health, production, and plant breeding and genetics.

Dr. Jeffrey Brecht, professor of postharvest plant physiology, Director of the Center for Food Distribution and Retailing (CFDR) at the University of Florida. As CFDR Director he interacts with commodity associations, packers, shippers, distributors, importers, exporters, processors and retailers to extend information regarding advances in perishable food handling. He was named a University of Florida Research Foundation Professor in 2002, a Fellow of the American Society for Horticultural Science in 2006, and an Honorary Member of the Florida State Horticultural Society in 2014.

This IST training and FDACS and CCA CEU roundups were conducted face to face in Gainesville and video conferenced to 7 registered host sites statewide. For some technical reasons, some of the off-campus sites were not able to get connected. The presentations are accessible at the hyperlinks at https://hos.ifas.ufl.edu/people/on-campus-faculty/guodong-david-liu/in-service-training/.

Dr. C.L. Harmon,
Disease update from the UF-IFAS Plant Diagnostic Center: Fruit and Vegetable Crops

Dr. N.S. Boyd
The evolution of weed management in vegetable production systems

Dr. R. Welch (Cornell University)
Using agriculture as a tool for better health

Dr. S. Agehara
Alternative Specialty Crops in Florida: Opportunities and Challenges

Dr. D. Chavez (University of Gerogia)
Peach Production and what we have learned

Dr. J. Brecht
New technology in postharvest plastics

This IST ended up with 26 participants. A survey was completed for overall evaluation, knowledge gain, and economic and environmental impacts at the end of the IST training. The evaluations are summarized below.

Overall Evaluation of the IST Training

The education program was rated on a 1 (low) to 5 (high) point scale and summarized below:

1. You've learned something new today: 4.5
2. The techniques you learned are useful: 4.2
3. Please rate your knowledge gain from today's program: 4.0
4. The knowledge you gained will help you or your growers save labor: 2.8
5. The knowledge you gained will help you or your growers save fertilizer: 3.3
6. You intend to change the behavior with the knowledge you gained today: 4.2

Knowledge Gain

Pre-and post-tests were matched by names and graded. Tests from either pre- or post-tests that had no match were not graded and discarded. The pre- and post-test grades were used to obtain means, median, and mode, standard errors, and percentage points of knowledge gain. On average, the trainees got a rise of 19 percentage points from this IST training. A table is generated with the data (Table 1).

Table 1. Statistics summary for the In-service Training event

Count of paired tests	**9**		**Knowledge gain (percentage points)**
Number of Questions	**16**		
Evaluation	**Correct answers (%)**		
	Pre-test	**Post-test**	
Mean	66	85	19
Median	56	81	25
Mode	56	81	25
Standard error	4.4	4.3	-

Estimate of economic impacts

The trainees estimated that the new techniques they learned from this IST training were able to help commercial crop producers reduce production cost of $51/acre and increase production as much as $167/acre on average. Thus, the increase in total income is $218/acre. The trainee serves 61 farms in size of 166 acres on average. There were 3 trainees answered the questions on economic impacts. Based on the survey, each trainee serves 61 farms and 166 acres/farm on average. The income increase including production savings was $218/acre (Table 2). Potentially, the total income increase would be $2,207,468.

Table 2. Estimate of economic and environmental impacts after the techniques from this IST training are employed for commercial crop production in Florida

# of Farms	**Farm Size**	**Estimate of Impact**	
		Cost Reduction	**Income Increase**
	(acre/farm)	**($/acre)**	**($/acre)**
61	166	51	167

Photos taken during the In-service Training

Photo 1a. Audience at 1308 Fifield Hall, Gainesville.

Photo 1b. Audience at 1308 Fifield Hall, Gainesville.

Photo 2. Dr. Tatiana Sanchez was moderating at 1308 Fifield Hall, Gainesville.

Photo 3. Dr. Carrie Harmon was presenting in India via Skype.

Photo 4. Dr. Nathan Boyd was presenting at 1308 Fifield Hall, Gainesville.

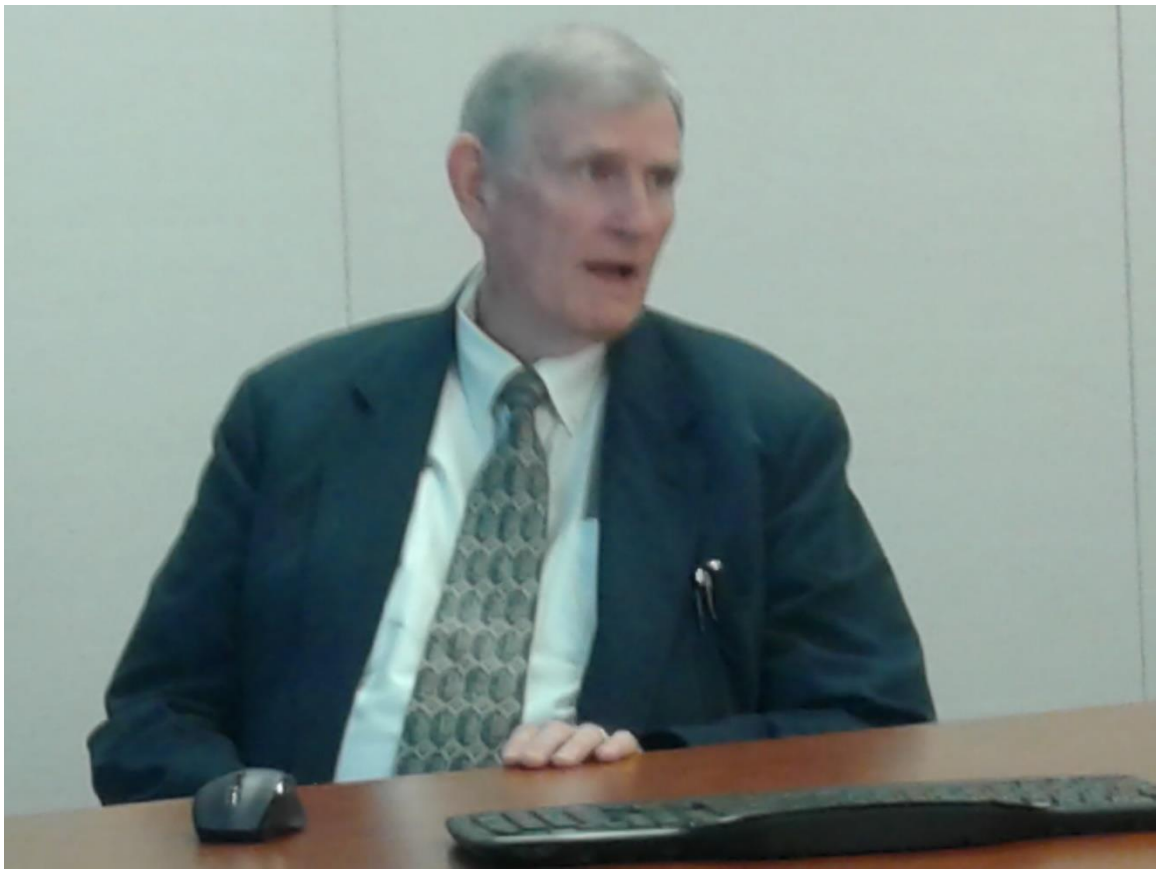

Photo 5. Dr. Ross Welch from Cornell University was presenting at 1308 Fifield Hall, Gainesville.

Photo 6. Dr. Shinsuke Agehara was presenting at 1308 Fifield Hall, Gainesville.

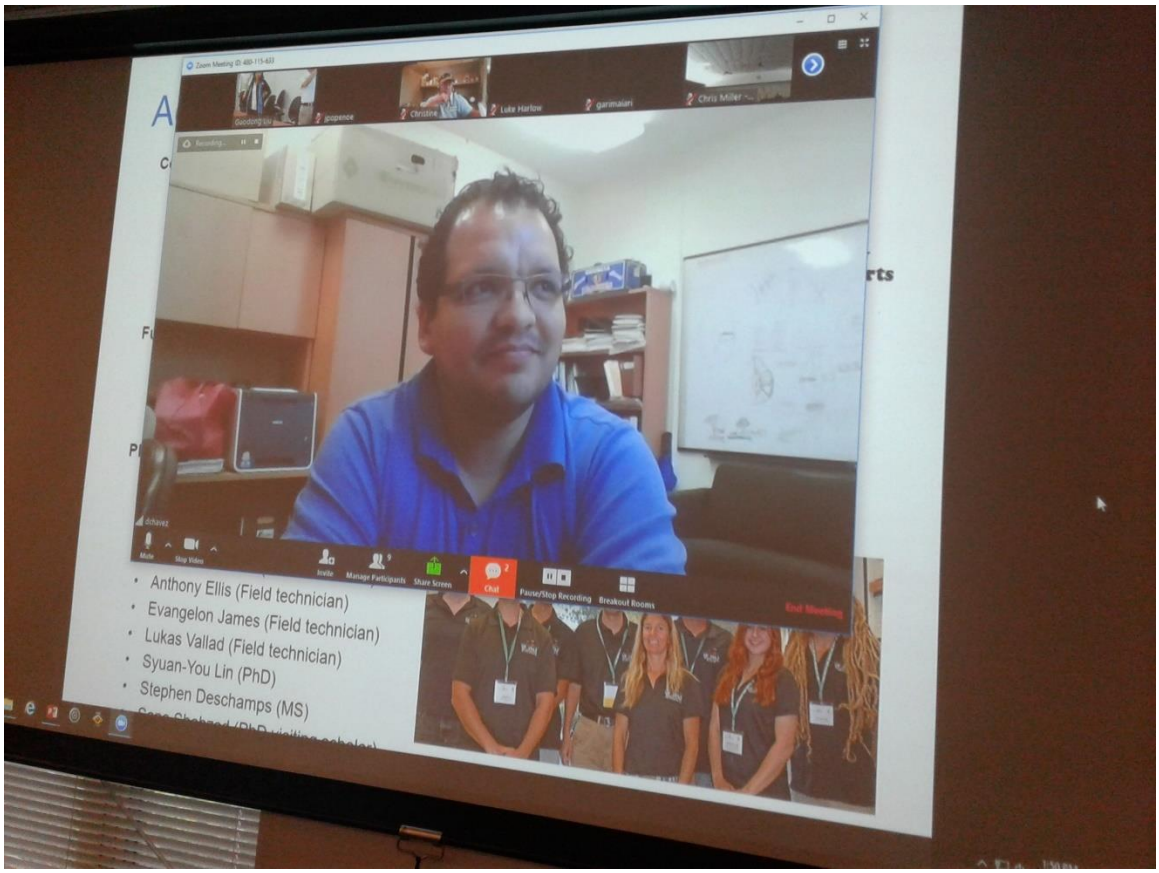

Photo 7. Dr. Dario Chavez from the University of Georgia was presenting in India via Skype.

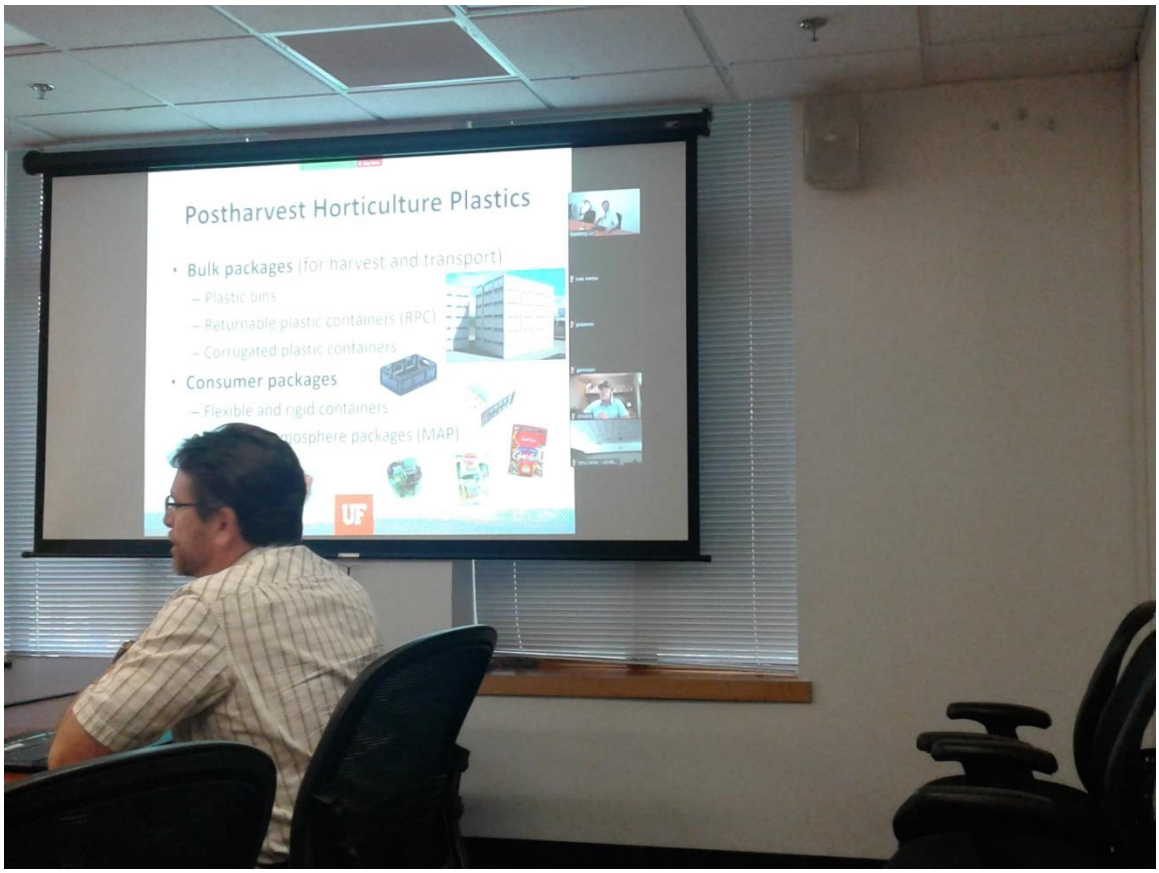

Photo 8. Dr. Jeffrey Bricht was presenting at 1308 Fifield Hall, Gainesville.

Table 3. Hosts for the In-service training (*IST# 31438*)

Total: 26 participants in 6 sites but the others were not able to get connected due to the technical issues.

Host Site	Phone Number	Building Name	Location	FDACS/CCA CEU provider's name	Email Address	# of attendees
Main Campus	352-273-4814	1306 Fifield Hall	2550 Hull Rd, Gainesville, FL 32611	Guodong (David) Liu	guodong@ufl.edu	19
UF IFAS Extension -Osceola County	321-697-3000	Extension Services in Osceola Heritage Park	1921 Kissimmee Valley Lane, Kissimmee, FL 34744	Jessica Sullivan	sullivan@ufl.edu	1
IFAS Extension Martin County	(772) 419-6962	2614 SE Dixie Highway	Stuart, FL 34996-4007	Yvette Goodiel	goodiel@ufl.edu	0
PBC Extension	561-233-1718	Clayton Hutcheson Ag Complex	Exhibit Hall A	Christian Miller	cfmiller@ufl.edu	3
Indian River Co Ext	772 226-4330	IRC Admin Complex, Bldg B	1800 27th St., Vero Beach	Christine Kelly-Begazo	ckellybe@ufl.edu	1
Lake County Extension	352-343-4101	Lake County Extension	1951 Woodlea Rd. Tavares, FL 32778	Juanita Popenoe	jpopenoe@ufl.edu	1
Clay Co. Ext.	(904) 284-6355	2463 St. Rd 16 W	2463 St. Rd 16 W, Green Cove Springs, FL 32043-0278	Luke Harlow	harlow1231@ufl.edu	1