

REPORT

of

In-Service Training (IST#: 31188), FDACS Program (#22891) and CCA Programs (FL 52806)

New Technology for Commercial Crop Production (V)

Conference ID: 7834290

Wednesday, February 22, 2017

Polycom from 1308 Fifield Hall to 12 registered host sites statewide



Dr. Philip F. Harmon

Innovations in plant disease diagnosis at
the UF IFAS Plant Diagnostic Center

Fertilizer and water quality
management for hydroponic crops



Dr. Jeffrey G. Williamson

Advances toward mechanical harvesting of
Florida blueberries for fresh markets

Fertilizer recommendations: soil
test to application



Dr. Tripti Vashisth

Peach production in Florida: challenges
and opportunities



Dr. Neil S. Mattson
Cornell University



Dr. Kelly Morgan

G. David Liu, Fred Fishel, and Kelly Morgan

Horticultural Sciences, Agronomy, and Soil and Water Science Departments

Tuesday, March 21, 2017

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The mechanical harvesting, fertilizer and water management for hydroponics, and other 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 labor and fertilizers. To provide an opportunity for our extension agents and graduate students to learn these new techniques, one out-state and four UF/IFAS extension specialists were invited to share their recent work at the New Technology for Commercial Crop Production (V) 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.

Presentation descriptions

The speakers' bio-sketches and their presentation descriptions are below:

Dr. P.F. Harmon, professor of plant pathology and extension specialist. His extension efforts have focused on providing rapid and accurate diagnostic services to the turfgrass, small fruits, and ornamental plant industries. He has served as an assigning editor for *Plant Disease Management Reports* and as an associate editor of *Applied Turfgrass Science*.

Title: Innovations in plant disease diagnosis at the UF/IFAS Plant Diagnostic Center
The presentation will discuss plant disease diagnosis and management from collecting a sample to interpreting the diagnosis and management recommendations. I will focus on the various technologies used to come to a diagnosis, and the methods we use to include science-based pesticide and other management recommendations for our clientele.

Dr. N.S. Mattson, statewide greenhouse specialist at Cornell University. Mattson is co-director of Cornell's Controlled Environment Agriculture group, a founding member of e-GRO Edibles and a

contributing member of e-gro.org. Mattson maintains a commercial greenhouse website at www.greenhouse.cornell.edu and a CEA website at www.cornellcea.com.

Title: Fertilizer and water quality management for hydroponic crops

Hydroponic crops have specialized water and fertilizer requirements. Water quality guidelines and the impact of open versus closed (recirculating) irrigation systems will be discussed. Strategies for managing pH and EC and common recipes for formulating nutrient solutions for a variety of crops will be given. Learn to identify and correct the most common nutrient disorders.

Dr. J.G. Williamson, professor, University of Florida. He has worked on multiple aspects of blueberry culture and management over the past 20 years including, adaptation of machine harvesting practices for fresh fruit markets. During the last 10 years, he has authored, or co-authored, 30 journal articles and numerous Extension and popular articles on temperate fruit crop production with emphasis on blueberry.

Title: Advances toward mechanical harvesting of Florida blueberries for fresh markets

Labor for hand-harvesting is the single largest production cost for Florida blueberry growers and labor availability has been limited in recent years. Reducing labor inputs through mechanized harvesting could significantly reduce production. This presentation will review various aspects of machine harvesting blueberries for fresh markets.

Dr. K.T. Morgan, professor of crop irrigation and nutrient management at the University of Florida. Dr. Morgan leads the Florida Best Agricultural Management Practices extension program and the Florida Automated Weather Network. He has published over 65 peer reviewed journal papers, 10 book chapters, and nearly 200 other publications.

Title: Fertilizer recommendations: soil test to application

The presentation will outline the 2016 Florida Springs and Aquifer Protection Act, basin management action plans and best management practices (BMPs). The presentation will further describe waterbodies that do not meet the established Water Quality Standards are deemed impaired and DEP must establish a total maximum daily load (TMDL) for the waterbodies.

Dr. T. Vashisth is assistant professor in horticultural sciences and citrus horticulture extension specialist at Citrus Research and Education Center, University of Florida. She received her PhD from University of Georgia in horticultural sciences and has been working on citrus and alternate crop production in Florida.

Title: Peach production in Florida

This presentation will focus on multiple aspects of subtropical peach production in Florida and the best peach production strategies to obtain good yield and quality fruit. Various subtopics discussed during presentation are site selection, fertilization and irrigation, plant growth regulators, and pest and disease management.

This IST training and FDACS and CCA CEU roundups were conducted face to face in Gainesville and video conferenced to 12 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 below.

Dr. P.F. Harmon,
[Innovations in plant disease diagnosis at the UF IFAS Plant Diagnostic Center](#)

Dr. N.S. Mattson
[Fertilizer and water quality management for hydroponic crops](#)

Dr. J.G. Williamson
[Advances toward mechanical harvesting of Florida blueberries for fresh markets](#)

Dr. K.T. Morgan
[Fertilizer recommendations: soil test to application](#)

Dr. T. Vashisth
[Peach Production in Florida](#)

More information can also be found at <http://hos.ufl.edu/faculty/gdliu/service-training>
This IST ended up with 27 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: | 4.4 |
| 2. The techniques you learned are useful: | 4.5 |
| 3. Please rate your knowledge gain from today's program: | 4.6 |
| 4. The knowledge you gained will help you or your growers save labor: | 3.7 |
| 5. The knowledge you gained will help you or your growers save fertilizer: | 4.3 |
| 6. You intend to change the behavior with the knowledge you gained today: | 4.3 |

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 19.9 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	10		Knowledge gain (percentage points)
Number of Questions	11		
Evaluation	Correct answers (%)		
	Pre-test	Post-test	
Mean	36.6	56.5	19.9
Median	40.5	54.5	14.0
Mode	45.0	55.0	10.0
Standard error	5.4	5.7	-

Estimate of economic and environmental 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 \$238/acre and increase production as much as \$276/acre on average. Thus, the increase in total income is \$514/acre. The trainee serves 55 farms in size of 88 acres on average. The attendees also estimated that these new techniques can help them reduce water pollution: decrease in nitrogen and phosphorus concentrations in groundwater.

Economic impacts

There were 4 trainees answered the questions on economic and environmental impacts. Based on the survey, each trainee serves 55 farms and 88 acres on average. The income increase including production savings was \$514/acre (Table 2). Potentially, every trainee can help growers increase their income by \$2,487,760 with these new techniques. The total income increase will be **\$9,951,040**.

Environmental impacts

By using these techniques, the trainees can help growers reduce water pollution by decreasing 22 ppb N and 21 ppb P in groundwater. Additionally, the techniques can help growers save nitrogen, phosphorus, and potassium of 38, 41, and 30 lb/acre, respectively (Table 2).

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 (acre/farm)	Estimate of Impact						
		Cost Reduction	Income Increase	Pollutant Reduction in Groundwater		Fertilizer Savings (lb/acre)		
		(\$/acre)	(\$/acre)	N (ppb)	P (ppb)	N	P	K
55	88	238	276	22	21	38	41	30

Photos taken during the In-service Training



Photo 1. Audience at 1308 Fifield Hall, Gainesville.

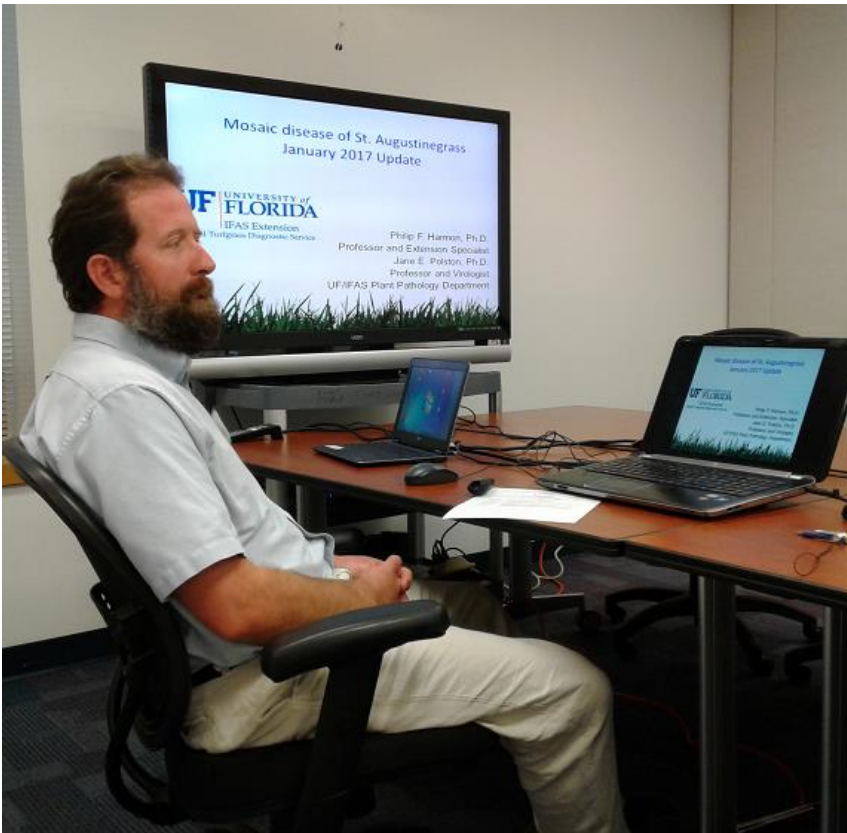


Photo 2. Dr. Phillip Harmon was presenting at 1308 Fifield Hall, Gainesville.



Photo 3. Dr. Neil Mattson from Cornell University was presenting at 1308 Fifield Hall, Gainesville.



Photo 4. Dr. Jeffrey Williamson was presenting at 1308 Fifield Hall, Gainesville.



Photo 5. Dr. Kelly Morgan was presenting at 1308 Fifield Hall, Gainesville.



Photo 6. Dr. Tripiti Vashisth was presenting in India via Skype.



Photo 7. Dr. Tatiana Sanchez was moderating at 1308 Fifield Hall, Gainesville.

Table 3. Thirteen Registered Host Sites**For****New Technology for Commercial Crop Production (V) (IST#: 31188/FDACS Program ID: 22891 and CCA Programs (FL 52806) (3 FDACS CEUs and 5 CCA CEUs)**

Total: 27 participants in 8 sites but the others were not able to get connected due to the technical issues.

Host Site	Phone Number	Location	FDACS/CC A CEU provider's name	Email Address
Main campus	325-273-4814	2550 Hull Rd., Gainesville, FL 32611	Guodong Liu	guodong@ufl.edu
CREC	863-956-5890	700 Experiment Station Rd., Lake Alfred, FL	Jennifer Dawson	jdawson@ufl.edu
Lake County Extension	352-343-4101	1951 Woodlea Rd. Tavares, FL 32778	Juanita Popenoe	jpopenoe@ufl.edu
Miami-Dade Extension	305-248-3311	18710 SW 288 th ST, Homestead, FL 33030	Qingren Wang	qrwang@ufl.edu
Palm Beach County	561-996-1657	Clayton E Hutcheson Ag Svc Center	Frank Dowdle	fdowdle@pbcgov.org
Volusia Co. Ext.	386-822-5778	Conference 1 UF/IFAS Extension in Volusia County 3100 E. New York Ave. Deland, Fl. 32724-6497	Joe Sowards	sewards@ufl.edu
Brevard County Ext.	321-633-1702	3695 Lake Drive, Cocoa, FL 32926-8699	Glen Bupp	gbupp@ufl.edu
Clay Co. Ext.	(904) 284-6355	2463 St. Rd 16 W, PO Box 278, Green Cove Springs, FL 32043-0278	Luke Harlow	harlow1231@ufl.edu
Indian River Co. Ext.	(772) 770-5030	1028 20 Pl Ste D, Vero Beach, FL 32960-5305	Christine Kelly-Begazo	ckellybe@ufl.edu

Seminole Co. Extension	(407) 665- 5560	250 W County Home Rd, Sanford, FL 32773	Kaydie G. McCormick	k.mccormick@ufl. edu
Osceola Co. Ext.	321) 697- 3000	1921 Kissimmee Valley Ln, Kissimmee, FL 34744-6107	Jessica Sullivan	sullivan@ufl.edu
Suwannee Valley Agricultural Extension Center	(386) 362- 1725 ext. 112	7580 CR 136, Live Oak, FL 32060-7434	Patrick A Troy	ptroy@ufl.edu
St. Johns Co. Ext.	(904) 209- 0430	3125 Agriculture Center Dr, St. Augustine, FL 32092	Bonnie Wells	bcwells@ufl.edu

Appendix 1: Departmental Seminar

After the IST training, Dr. Neil Mattson was also invited to give a seminar entitled:

A systems approach to improving the abiotic stress tolerance of horticulture crops

to the faculty and graduate students at 1306 ~1308 Fifield Hall on February 23 from 11:00 to 12:00 PM. Dr. Steven Sargent introduced the speaker to the audience. There were approximately 20 attendees. After the seminar, Dr. Neil Mattson had a lunch meeting with Dr. David Liu's group. Then, Dr. Mattson visited UF/IFAS Plant Science Research & Education Unit in Citra. Dr. Liu summarized the blueberry project on enhancing nitrogen use efficiency funded by USDA-AMS/FDACS. Our former M.S. student, Miss Yang Fang introduced the fertigation system and the monitoring system of moisture, temperature, and electrical conductivity she used for the project.

After that, Dr. Xin Zhao had a meeting with Dr. Neil Mattson at 1306 Fifield Hall to discuss possible collaboration in the future. Dr. Neil Mattson left Gainesville for Cornell University in the evening.



Photo 8. Miss Yang Fang was introducing the fertigation system she used for her M.S. research project at UF/IFAS Plant Science Research & Education Unit in Citra.