

In-Service Training (IST#: 31765)/CEU Roundup (**FDACS Program # 28512/CCA ID: FL 53631**)

New Technology for Commercial Vegetable and Fruit Production (VIII)

The Zoom link: <https://ufl.zoom.us/j/5010757015>

IT Professional: Mr. Dennis Brown

Cell phone: (352)317-1701

Zoom from 1306 Fifield Hall, Gainesville, Florida to off-campus host sites statewide

Wednesday, February 26, 2020



Dr. D. Leskovar
Texas A&M



Dr. J. Grosser



Dr. A. Sarkhosh

Vegetable Crop Management Practices: Balancing Yield and Quality

Why Can Fertigation Improve Potato Production?

Solving Citrus Greening with Genetics and Nutrition

Integrating pest biology, crop phenology and insecticide use to manage arthropods attacking vegetable crops

Understanding and Managing the Impact of climate Change on Fruit Production

Labor and Production Trends in the US Agriculture



Dr. G.D. Liu



Dr. H. Smith



Dr. D. Farnsworth

G. David Liu and Ali Sharkhosh
Horticultural Sciences Department

Contributors to this IST program

Proposers

Guodong (David) Liu (Primary contact)
Ali Sharkosh

Overviewer

Steven Sargent

Moderator

Wendy Mussoline

IT

Dennis Brown

Speakers

Daniel Leskovar
Guodong (David) Liu
Hugh Smith
Jude Grosser
Ali Sharkosh
Dereck Farnsworth

Helpers

Mary Dixon – pre-test
Thioro Fall – post-test
Yanlin Wang – sign-in sheet
Christianah Oladoye – survey
Jonathan Denison – refreshments and lunch
Yuheng Qiu – FDACS CEU attendance sheet
Yupeng Zhou – CCA CEU sheet
Yujie (Joy) Jiao – survey
Xia Tian – photos

Local Hosts

Jonael Bosques
Christine Cooley
Courtney Darling
Kimberly Glasscock
Christine Kelly-Begazo
Christian Miller
Matthew Orwat
Tyler Pittman
Juanita Popenoe
Jessica Sullivan

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New concepts and/or new techniques have been developed to help growers make the right decisions for crop production. Integrating these new techniques in farming management will improve profitability and sustainability for producers in Florida. It can also help enhance the use efficiency of natural resources such as water and fertilizers, hence, toward best management practices (BMPs). To provide an opportunity for our extension agents, CCAs, and graduate students to learn about these new techniques, one out-state and five UF/IFAS extension specialists were invited to share their expertise for Commercial Crop Production (VIII) In-Service Training (IST) training program on February 26, 2020.

The objective of this IST was to introduce new concepts and technologies of BMPs developed for Florida's crop production systems. These systems enhance the sustainability of commercial crop production in Florida. The training program focused on the management of diseases and pests, nutrient management and fertigation, management of climate change, and economics for better crop production. Six Extension specialists from both Texas A&M and UF/IFAS presented.

The presentations covered improving and prolonging vegetable and fruit production, improving the efficiency of foliar sprays, nutrient stewardship, nematode management, and breeding for crop production with better management of challenges in crop production in Florida.

This IST training and FDACS/CCA CEU roundups were conducted face-to-face training in Gainesville and video-conferenced training in 10 registered host-sites statewide. There were 54 participants for this IST training event. For some reason, there were no data reported from one of the off-campus sites. The presentations are accessible at the hyperlinks at <https://hos.ifas.ufl.edu/people/on-campus-faculty/guodong-david-liu/in-service-training/>

This IST ended up with 54 participants. Thirty-four attendees earned FDACS and/or CCA CEUs. A total of 174 CEUs were provided: thirty of them won 150 FDACS CEUs, and four of them earned 24 CCA CEUs. A survey was completed for an 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: 3.5
 5. The knowledge you gained will help you or your growers save fertilizer: 3.8
- You intend to change the behavior with the knowledge you gained today: 4.0

Knowledge Gain

Pre-and post-tests were matched by names and graded. Results from only pre- or post-tests without matching 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 16 % 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	29		Knowledge gain (percentage points)
Number of Questions	15		
Evaluation	Correct answers (%)		
	Pretest	Posttest	
Mean	52	68	16
Median	53	76	23
Mode	53	82	29
Standard error	2.1	3.9	-

Economic impacts

On average, 10 trainees answered the questions on economic and environmental impacts. Based on the survey, 19 farms and 175 acres on average were put in to use. The expected income increase, including production savings, was \$489/acre (Table 2). Potentially, every trainee can help growers increase their income by \$1,625,925 with these new techniques. Thus, resulting in a total increase of \$16,259,250.

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

# of Farms	Farm Size	Cost Reduction	Income Increase	Pollutant Reduction in Groundwater		Fertilizer Saving (lb/A)			Water Saving
	(A/farm)	(\$/A)		N (ppb)	P (ppb)	N	P	K	1000 gal/A)
19	175	234	255	15	15	27	34	40	40

Environmental impacts

By using these techniques, the trainees can help growers reduce water pollution by decreasing 15 ppb N and 15 ppb P in groundwater. Additionally, the techniques can help growers save nitrogen, phosphorus, and potassium of 27, 34, and 40 lb/acre, respectively (Table 2).

Presnetation Description

Title: Vegetable Crop Management Practices: Balancing Yield and Quality

Specialist: Daniel Leskovar(Texas A&M University)

Description: The interaction of genetics (G), environment (E) and management practices (M), or G×E×M for short, has direct or indirect effects on root/shoot growth, physiology, marketable yield and quality traits of vegetable products. Once a particular cultivar (variety/genotype) is selected by a grower, the expression of yield components and quality traits associated with sweetness, color, or size will depend on the environment of the growing location such as light, temperature, rainfall, soil type and salinity, and selected cultural strategies such as planting time, nitrogen fertilization, irrigation, pest control, soil amendments, plant growth regulators, cultivation techniques, grafting, plant density, and/or harvest times. Designing efficient management strategies targeting nutritional, quality, and yield attributes will benefit growers and consumers demanding high-quality produce.

Title: Why Can Fertigation Improve Potato Production?

Specialist: Guodong David Liu. (University of Florida/IFAS)

Description: Florida is one of 14 states predicted to face “high risk” water shortage by the year 2050. In Central Florida alone, we have to find an additional 200×10^6 gal/day to meet the needs by 2030. That requires conservation in agriculture because crop production is a major water consumer. Seepage irrigation is the basic irrigation approach for potato production in Florida and uses 20” irrigation water per growing season. Based on our research data, we have found that there is a great potential to save irrigation water if we convert seepage to center pivot irrigation. Using a more efficient irrigation approach will help Floridians alleviate water shortage problems. Using fertigation can increase tuber yield by 20% and save fertilizers by 30%. Fertigation can be an effective BMP tool for potato production in Florida.

Title: Solving Citrus Greening with Genetics and Nutrition

Specialist: Jude Grosser (University of Florida/IFAS)

Description: Most commercially important citrus scions and rootstocks are considered to be moderate to highly susceptible to Citrus greening disease or huanglongbing (HLB). The disease is now endemic in Florida and threatens the industry. HLB causes severe secondary and micronutrient deficiencies in roots of infected trees. A constant supply of elevated amounts of the impacted nutrients applied to roots helps trees recover, improving yield and fruit quality. Our program has screened thousands of rootstock hybrids in search of rootstocks that can mitigate the disease in grafted commercial scions. We have also generated new commercial scions with improved HLB tolerance. The combination of the improved scion and rootstock genetics with enhanced nutrition is showing promise for sustainable and profitable citriculture in Florida.

Title: Integrating pest biology, crop phenology and insecticide use to manage arthropod pests attacking vegetable crops

Specialist: Hugh Smith (University of Florida/IFAS)

Description: Florida’s tropical and subtropical growing environments provide favorable conditions year-round for insect and mite pests of horticultural crops. Intensive insecticide use can lead to the development of insecticide resistance if resistance management guidelines are not followed. This presentation will focus on the design of insecticide programs using the treatment interval approach to offset the development of resistance. The role of insecticides within the broader context of integrated pest management will be discussed.

Title: Understanding and Managing the Impact of Climate Change on Fruit Production

Specialist: Ali Sarkhosh (University of Florida/IFAS)

Description: In fruit crops such as peach and blueberry vegetative and fruiting buds develop during the summer on the current season growing branches. As winter approaches, the already developed buds go dormant in response to both shorter day lengths and cooler temperatures. These buds remain dormant until they have accumulated sufficient chilling units (hours) of cold weather. The chill unit/hours counts any hour

between 32°-45° F. When temperatures are below or above this range, chill units do not accumulate and could be subtracted if the temperatures are too high. This means that during warm, sunny weather during tree dormancy, chill units do not accumulate and if too warm of weather, the negation of earlier accumulated chill occurs. When enough chilling accumulates, the buds are ready to grow in response to warm temperatures. As long as there have been enough chilling hours the flower and leaf buds usually develop. In the last few years, significant variations in chilling unit accumulation have been observed in FL.

Title: Labor and Production Trends in the US Agriculture

Specialist: Derek Farnsworth (University of Florida/IFAS)

Description: Agricultural production in the United States is subject to a variety of influences including consumer tastes, trade negotiations, climate changes, labor shortages, and technological innovation, to name a few. This presentation provides an overview of changing production trends in the US agriculture, with an emphasis on the impact of the changing labor landscape in the Florida fruit and vegetable industry.

Bio-Sketch of Speakers

Daniel Leskovar, professor in vegetable crop physiology at Texas A&M University, received degrees in Horticulture from Universidad del Comahue, Argentina; post-graduate training at the University of Wageningen, the Netherlands; Master of Science at UC Davis, and Ph.D. at the University of Florida. His current research is on seed-transplant physiology; soil and plant growth regulators; grafted tomato; high tunnel/hydroponics; and genotype selection for heat and drought stress tolerance, yield, quality, and water use efficiency. He is the current chair of the International Society for Horticultural Sciences (ISHS) Division ‘Vegetables, Root and Tubers’. Dr. Leskovar has authored +150 journal publications and is a member of three editorial boards.

G. David Liu is a state extension specialist responsible for nutrient eco-management of vegetable and fruit crops. David obtained his Ph.D. in Plant Nutrition from the Chinese Academy of Agricultural Sciences, Beijing, China, M.S. in Plant Physiology and Biochemistry, and B.S. in Agronomy both from Hunan Agricultural University, Changsha, China. His academic interests include improving nutrient and water use efficiencies for commercial crop production. He works closely with state and county faculty and growers to enhance the sustainability of agriculture and the environment as a component of best management practices (BMPs).

Jude Grosser, professor of citrus genetics and breeding, received his M.S. degree in Biology at Morehead State University (Morehead, KY); and his Ph.D. in Genetics and Plant Breeding at the University of Kentucky (Lexington, KY). Dr. Grosser has worked at UF in citrus genetics and breeding for the past 35 years, integrating emerging biotechnologies with conventional citrus breeding. His specialties include somatic hybridization and cybridization, somaclonal variation, embryo rescue, ploidy manipulation, scion breeding, rootstock breeding, and genetic transformation. Dr. Grosser received the ASHS Outstanding Career Researcher Award in 2005, and was elected ASHS Fellow in 2013. Dr. Grosser has authored more than 150 journal publications and served on several editorial boards. For the past 10+ years, Dr. Grosser’s research has focused on the development of permanent genetic solutions to HLB.

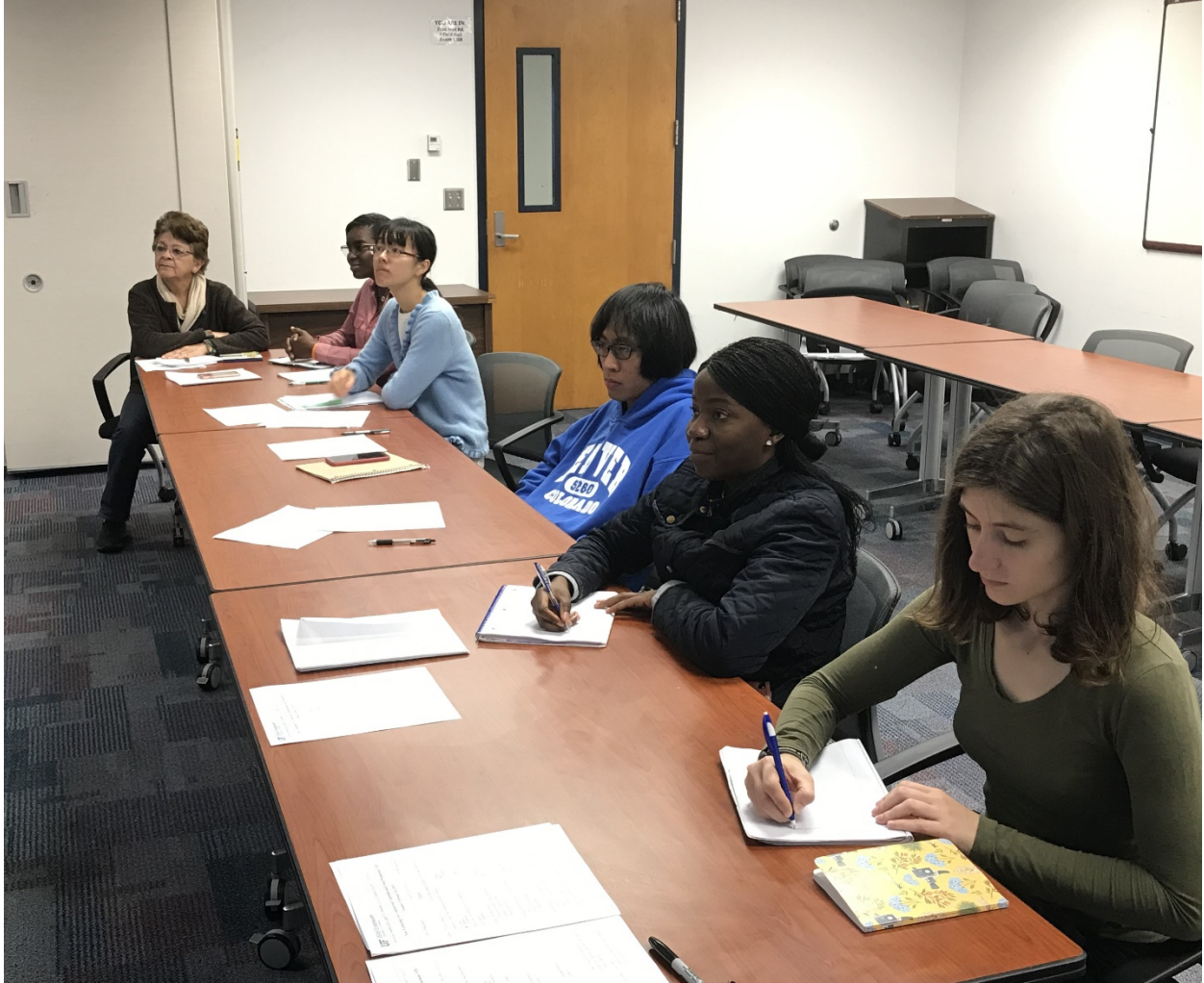
Hugh Smith, associate professor of entomology at the University of Florida’s Gulf Coast Research and Education Center, received his undergraduate degree from Brown University, and his M.S. and Ph.D. from the University of Florida. Hugh works on integrated management of arthropod pests of horticultural crops. He has worked in Guatemala, the Mariana Islands, Vietnam, California and New England. Hugh joined GCREC in 2010.

Ali Sarkhosh, assistant professor and fruit crop Extension specialist with over 8 years of experience with commercial fruit production in the U.S., Australia, and New Zealand. He joined the University of Florida in October 2017, and his research with fruit crops has focused on the evaluation of cultural practices to optimize yield and production efficiency and includes work in the following areas; optimizing production systems including; crop load, canopy management, tree size control, application of PGRs, irrigation and nutrition management, tree fruit breeding and rootstock evaluation.

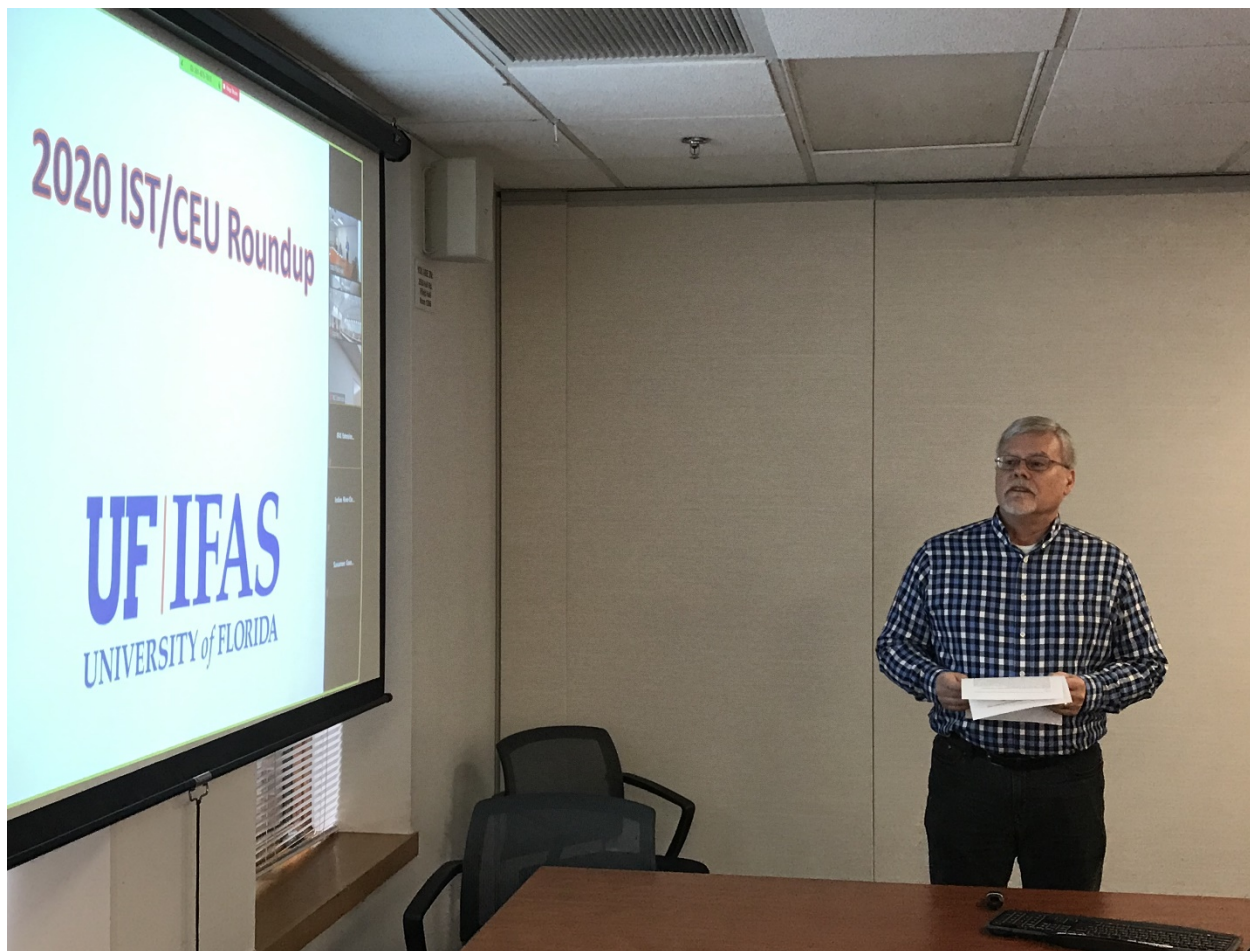
Derek Farnsworth, assistant professor and extension specialist in the Food and Resource Economics Department at the University of Florida. Dr. Farnsworth performs research in the areas of production and labor economics, where he has investigated topics including the economic effects of citrus greening in Florida and the productivity of H-2A program workers in the Florida citrus industry.



Audience in Fifield Hall Gainesville for the IST Program (I)



Audience in Fifield Hall Gainesville for the IST Program (II).



Dr. Steven Sargent is giving an overview of the program.



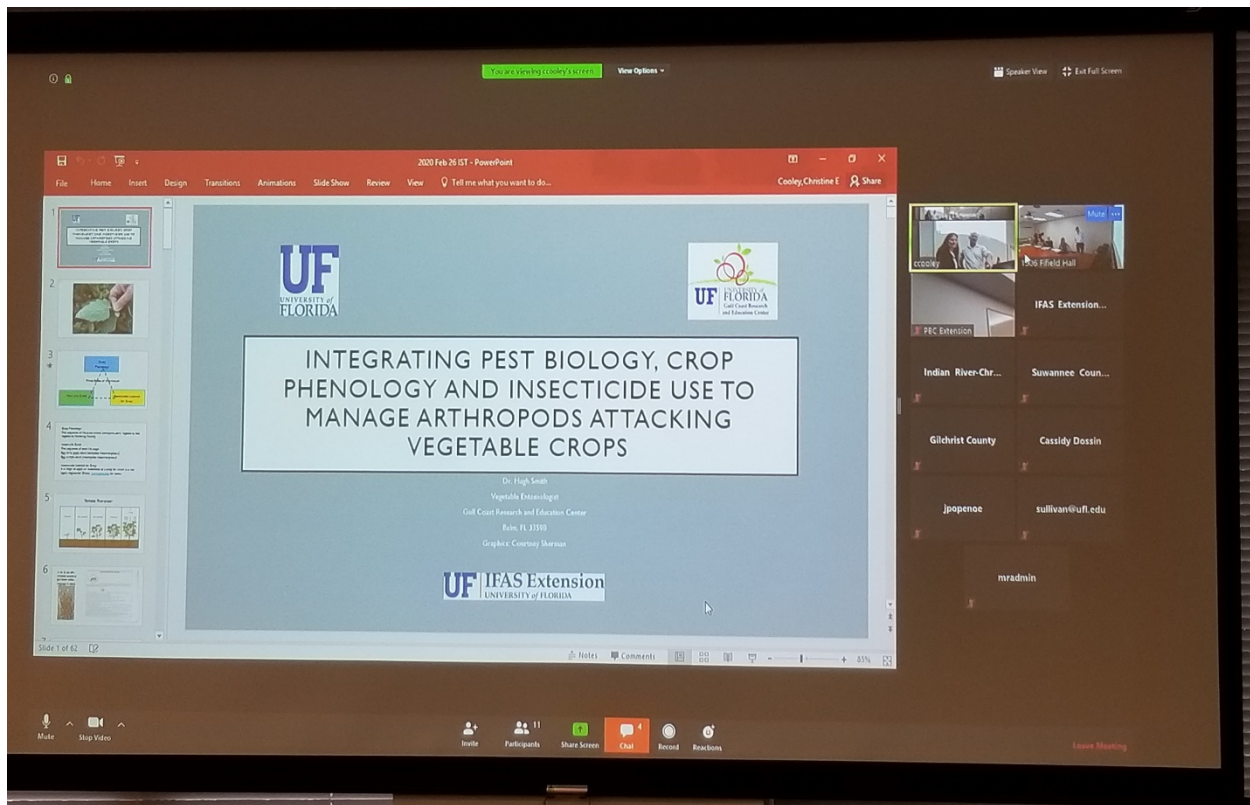
Dr. Wendy Mussoline is moderating the IST program.



Dr. Daniel Leskovar from Texas A&M is presenting for the IST program.



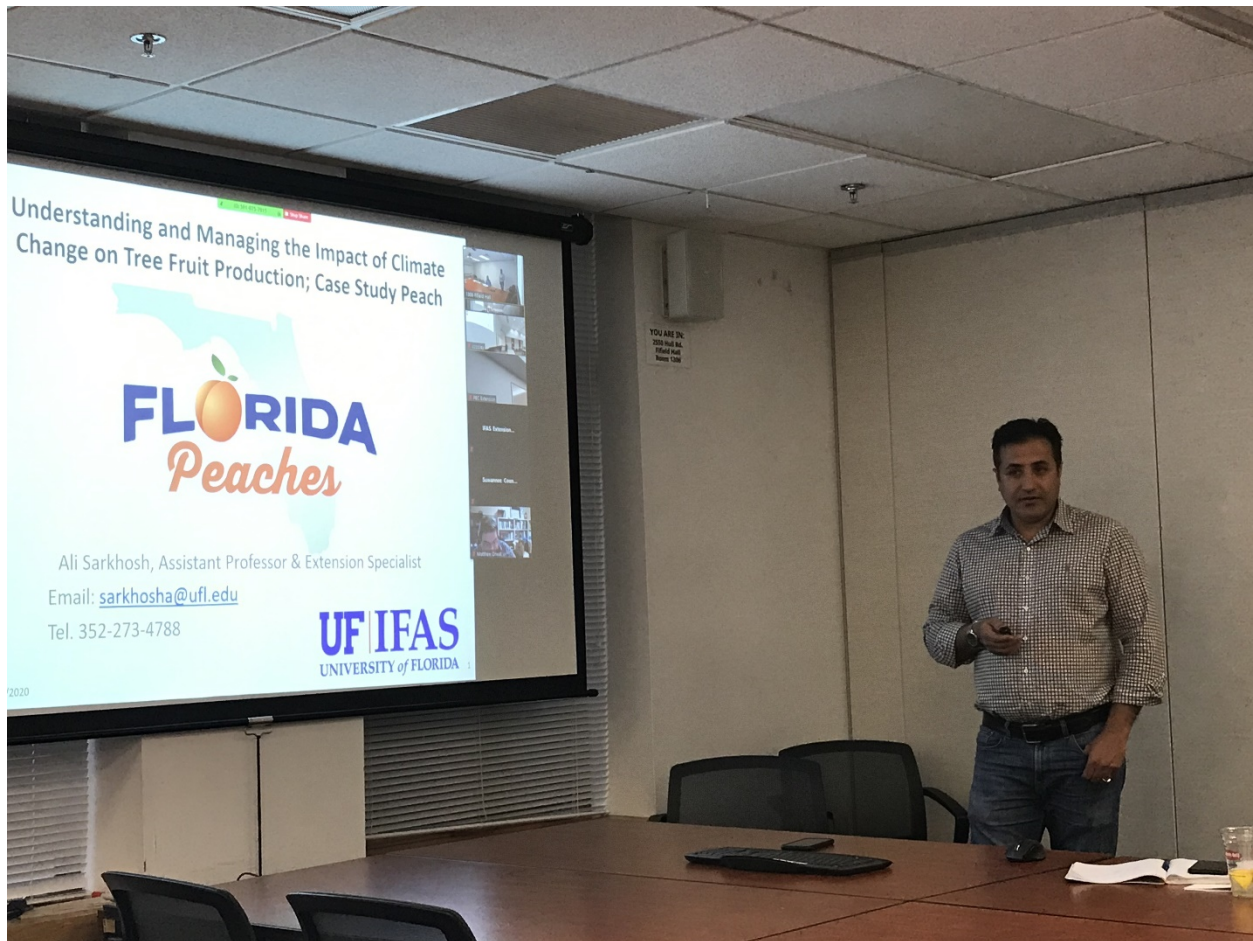
Dr. Guodong (David) Liu is presenting for the IST program.



Dr. Hugh Smith is presenting for the IST program via Zoom at GCREC.



Dr. Jude Grosser is presenting for the IST program.



Dr. Ali Sharkhosh is presneting for the IST program.



Dr. Dereck Farnsworth is presenting for the IST program.

The host sites of the IST training program with 5 FDACS CEUs and 6 CCA CEUs on 2/26/2020

Site ID	Host Site	Phone Number	Building Name	Location	CEU provider	Email Address	# of Attendees	# of CEU Winners
								FDACS+CCA
1	UF Main Campus	352-273-4814	1306 Fifield Hall	2550 Hull Rd, Gainesville, FL 32611	Guodong (David) Liu	guodong@ufl.edu	21	3+0
2	UF IFAS Extension – Vero Beach	772-226-4316	Rm B-501	1800 27 th St., Vero Beach, FL 32960	Christine Kelly-Begazo	ckellybe@ufl.edu	6	5+2
3	UF IFAS Extension - Osceola County	321-697-3000	Extension Services	1921 Kissimmee Valley Ln, Kissimmee, FL 34744	Jessica Sullivan	sullivan@ufl.edu	No data	No data
4	UF IFAS Extension – Lake County	352-343-4101	Lake County Extension	1951 Woodlea Rd. Tavares, FL 32778	Juanita Popenoe	jpopenoe@ufl.edu	2	2+0
5	UF/IFAS Extension – Palm Beach County	561-233-1718	Clayton Hutcheson Ag Complex	Exhibit Hall A	Christian Miller	cfmiller@ufl.edu	3	1+2
6	UF/IFAS Extension – Suwannee County	386-362-2771	Back Classroom in Extension Office	1302 11 th St SW Live oak, FL 32064	Courtney Darling; Kimberly Glasscock	darlingc@ufl.edu ; kglasscock@ufl.edu	4	4+0
7	UF/IFAS GCREC	813-419-6670	Auditorium	14625 CR 672, Wimauma, FL 33598	Christine Cooley	ccooley@ufl.edu	10	9+0
8	UF/IFAS Extension – Hardee County	863-773-2164	Conference Room	507 Civic Center Drive, Wauchula FL 33813	Jonael Bosques	jonael@ufl.edu	2	2+0
9	UF/IFAS Extension – Gilchrist County	352-463-3174	Gilchrist County Emergency Operations Center	3250 U.S. 129 Bell, Florida, 32619	Tyler Pittman	Pittmanh1@ufl.edu	5	4+0
10	UF/IFAS Extension – Washington County	850-638-6180	UF IFAS Extension Washington County	1424 Jackson Ave., Suite A. Chipley Fl. 32428-1628	Matthew Orwat	mjorwat@ufl.edu	1	0
Total							54	30+4