

In-Service Training ([IST#: 31605](#))/CEU Roundup ([FDACS Program # 26139/CCA ID: FL 53350](#))

New Technology for Commercial Vegetable and Fruit Production (VII)

Join from PC, Mac, Linux, iOS or Android: <https://ufl.zoom.us/j/355626855>

IT Professional: Mr. Dennis Brown

Cell phone: (352)317-1701

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

Tuesday, February 26, 2019



Dr. J. Crane

Technology to improve and prolong production
of selected tropical fruits

Overcoming the leaf cuticle as a barrier to
foliar sprays



Dr. S. Flis
The Fertilizer Institute

4R nutrient stewardship for crop production

Overview of nematodes, why they are important
and difficult to manage



Dr. G. Sandoya

How can breeding help lettuce growers
manage challenges?

Opportunities and challenges of current breeding
through Biotechnology



Dr. E. Etxeberria



Dr. D. Dickson



Dr. A. Huo

Instructions for local Hosts:

1. Download and print the **Sign-in sheet; Pre-test; Post-test; and Survey**
2. Have all your participants fill out or complete
 - The sign-in sheet
 - The pre-test before the first presentation starts
 - The post-test and survey after the last presentation is completed
3. Mail the above papers including **sign-in sheet, pre-test, post-test, survey** to **David Liu at PO Box 110690, 1253 Fifield Hall, Gainesville, FL 32611-0690** on **February 26th, 2019** at 4:30 PM
4. Collect the questions from your participants, email them to guodong@ufl.edu, and the answers will be sent to you
5. The CEU attendance forms will be emailed to those who need and have already put their **Pesticide License #** on the sign-in sheet.
6. Charge your attendees for their lunch costs about **\$10/person**

All the materials plus related publications are available online at:
<https://hos.ifas.ufl.edu/in-service-training/>

Conference information

Join from PC, Mac, Linux, iOS or Android: <https://ufl.zoom.us/j/355626855>

IT Professional: Mr. Dennis Brown

Cell phone: **(352)317-1701**

All sites need to be manually got connected at 8:30 am EST.

New Technology for Commercial Crop Production (VII)

In-Service Training

Agenda

Tuesday, February 26, 2019

Dr. Wendy Mussoline: Moderator

9:00-9:10 AM:	Sign-in and Pre-test Gather, Refreshments,
9:10-9:20 AM	Dr. Steven Sargent: Welcome and Introduction
9:20-10:10 AM	Dr. Jonathan Crane: Technology to improve and prolong production of selected tropical fruits
10:10-11:00 AM	Dr. Edgardo Etxeberria: Overcoming the leaf cuticle as a barrier to foliar sprays
11:00-11:50 AM	Dr. Sally Flis (The Fertilizer Institute, Washington D.C.): 4R nutrient stewardship for crop production
11:50-1:00PM	Lunch break
1:00-1:50 PM	Dr. Donald Dickson: Overview of nematodes, why they are important and difficult to manage
1:50-2:40PM	Dr. German Sandoya-Miranda: How can breeding help lettuce growers manage challenges?
2:40-3:30PM	Dr. Alfred Huo: Opportunities and challenges of current breeding through Biotechnology
3:30-3:50PM	Post-test and survey
3:50PM	Adjourn

For local hosts:

3:50-4:30 PM	Mail the Sign-in sheet, pre- and post-test, and survey to David Liu at 1253 Fifield Hall, PO Box 110690, Gainesville, FL 32611-0690 or scan and email the papers to guodong@ufl.edu
--------------	--

Proposers:

Dr. Guodong (David) Liu

(Primary Contact)

Assistant Professor and Crop Nutrition
Specialist

Horticultural Sciences Department
1229 Fifield Hall, P.O. Box 110690
Gainesville, FL 32611-0690
(352)273-4814

guodong@ufl.edu

Bldg. 164, P.O. Box 110710

University of Florida
Gainesville, FL 32611

(352) 392-4721

weeddr@ufl.edu

Dr. Frederick Fishel

Professor

Agronomy Department

Director

UF/IFAS Pesticide Information Office

Dr. Kelly Morgan

Associate Professor

Soil and Water Science Department

Southwest Florida Research and Education
Center

2685 State Road 29 North

Immokalee, Florida 34142

(239) 658-3413

conserv@ufl.edu

Available CEUs

<u>FDACS CEUs</u>	
AG ROW CROP PEST CONTROL	3
AG TREE CROP PEST CONTROL	3
487 GENERAL STANDARDS/CORE	3
PRIVATE APPLICATOR AG PEST CONTROL	3
482 GENERAL STANDARDS/CORE	3
Maximum	6
<u>CCA CEUs</u>	
Nutrient Management	1
Pest Management	1
Crop Management	4
Total	6

Speakers' Presentation Description and Bio-Sketch

This program will have six specialists to present. The presentations cover tropical fruit production, 4R nutrient stewardship, nematode management, agrochemical delivery and crop breeding.

Presentation Description

Title: Technology to improve and prolong production of selected tropical fruits

Specialist: Crane, Jonathan H. (University of Florida, IFAS, TREC)

Presentation description: There are several basic cultural methods to prolong production of tropical fruit crops. These include shoot and limb pruning and bending for guava and carambola, mechanical or chemical defoliation for guava and carambola, soil applied chemicals to stress trees such as longan, and crop sacrifice for carambola and papaya. In addition, properly pruning single-stemmed papaya plants (called ratooning) stimulates branching and prolongs the time of efficiently harvested fruit production. Timing of these methods based on tree phenology and weather conditions is important for success.

Title: Overcoming the leaf cuticle as a barrier to foliar sprays

Specialist: Ed Etxeberria (University of Florida, IFAS, CREC)

Presentation Description: In horticulture, foliar sprays are the preferred means to deliver agrichemicals given the large leaf surface area and the fact that these are vastly more accessible than the root system. However, penetration of externally applied substances into leaves is severely hindered by the presence of the protective cuticle (composed of hydrophobic wax/cutin) found on leaves and young stems. Only a small percent of agrochemicals enters the plant, the remaining being washed into the ground with undesirable environmental impact. To bypass the cuticular barrier and increase infiltration, we have tested laser-based alternatives. Laser energy perforates or removes the cuticle depending on the laser used and facilitate the penetration of applied substances.

Title: 4R nutrient stewardship for crop production

Presentation Description: 4R Nutrient Stewardship provides a framework to achieve cropping system goals, such as increased production, increased farmer profitability, enhanced environmental protection and improved sustainability. The framework achieves these goals through adaptive management considering the right source of fertilizer, at the right rate, at the right time, and in the right place. As cropping goals change 4R Nutrient Stewardship practices will change with them. In Florida, The Fertilizer institute has worked with potato, tomato, and citrus growers to learn about what practices are working in the field for them and what are the costs for making practice changes. This session will talk about 4R Nutrient Stewardship through the results of the 4R Research Fund and experiences with 4R Advocates.

Title: Overview of nematodes, why they are important and difficult to manage

Specialist: Donald Dickson (University of Florida, IFAS, Entomology and Nematology Department)

Presentation Description: The most important plant-pathogenic nematodes that harm Florida agriculture will be discussed. Emphasis will be placed on newly emerged species that are being shown to have a high degree of plant virulence, and why these species are a threat to agriculture. Methods of nematode management will be shown including crop management, host-plant resistance, regulations, biological control, soil suppressiveness, and fumigant, nonfumigant, and experimental nematicides.

Title: How breeding can help lettuce growers manage challenges?

Specialist: Germán Sandoya (University of Florida, IFAS, EREC)

Presentation Description: Florida grows 3% of the national production of lettuce in the US with a value of \$70 million dollars to growers grouped at the Everglades Agricultural Area (EAA). There is a significant amount of small operations that grow lettuce in other nontraditional settings that do not account for the 15,000 acres of lettuce in Florida. The crop faces many challenges with diseases being the top priority in any type of operations. Lettuce improvement is mostly focused on diseases, but other areas such as postharvest, water and nutrient use efficiency will be a top priority in the future. Lettuce breeding will be done for protected environments as these types of operations are increasing worldwide.

Title: Opportunities and challenges of current breeding through biotechnology

Specialist: Alfred Huo (University of Florida, IFAS, MFREC, Apopka, FL 32703)

Presentation Description: To cope with the increase in world population and the need to protect the environment, developing crops that are better adapted to abiotic and biotic stresses is important for sustainable food production in many parts of the world today. Conventional breeding including hybridization and mutagenesis have been dominant methods for years in genetic improvement of plant characteristics. However, innovation in plant breeding is necessary to meet the challenges of global changes such as population growth and climate change. New techniques have to be adopted to integrate into current breeding approaches to improve the breeding efficiency for accelerating breeding process and maximizing breeding output. Although breeding techniques such as genomic selection and genome editing have been recently developed, their potential roles in the growth and sustainability of global food supplies and how to influence our farmers have not been recognized. In this training, the milestones of plant breeding techniques including domestication, mutation breeding, cross breeding, genetic engineering, marker-assisted selection, targeted/precision breeding will be reviewed; some of the main achievements from each area and their common characteristics and individual limitations will be discussed and highlighted. The new cutting-edge breeding technique, CRISPR/Cas9-mediated genome editing will be emphasized. The following questions will be discussed: what are the advantages and disadvantages of CRISPR in plant breeding? What is the difference between the gene-edited crop and traditional GM crops? How are gene-edited crop regulated? Is gene-edited suitable for organic farming? Can you detect a gene-edited crop variety from the one developed with conventional breeding techniques? What is the status of research and development of big ag-companies with CRISPR technology?

Speakers' BioSketch

Dr. Jonathan H. Crane, professor of horticultural science in the Horticultural Science Department at UF/IFAS and located at the Tropical Research and Education Center in Homestead has over 30 years' experience with the horticulture of tropical fruit crops. During this time, he has collaborated with colleagues on cultural practices to enhance and induce off-season fruit production on guava, carambola, longan, and papaya. Dr. Crane's programs are split among extension (~60%), research (~20%), teaching (~10%) and administration (~10%). He has authored or co-authored over 71 extension publications and 62 refereed journal publications.

Dr. Ed Etxeberria, Professor of plant physiology at the Department of Horticultural Sciences, CREC, Lake Alfred. All degrees (B.S., M.S., and Ph.D.) in Botany from University of Massachusetts Amherst and University of Florida. soil biogeochemistry and soil fertility management at Cornell University, received his graduate degrees in Soil Science at the University of Bayreuth, Germany. During the past 12 years, I have focused on the mobility mechanisms of the citrus greening causing agent CLas within the tree. Also, on ways to improve penetration of substances to ameliorate the effects of citrus greening.

Dr. Sally Flis is the Director of Agronomy at The Fertilizer Institute (TFI) in Washington D.C. In her role at TFI, Sally works with the 4R Nutrient Stewardship programs to help increase the science base and understanding of on-farm practice implementation. Sally is also involved in providing science support for state and national nutrient policy issues. Before joining TFI, Sally worked with famers in the Northeastern U.S. to implement and develop nutrient management plans. Dr. Flis received her Ph.D. in Plant and Soil Science from the University of Vermont, her M.S. Dairy Science and B.S. in Dairy Science and Agronomy from the University of Wisconsin-Madison.

Dr. Donald Dickson is a member of the Department of Entomology and Nematology, University of Florida. He received advanced degrees in plant pathology from Oklahoma State University and North Carolina State University. The focus of research has been on plant pathogenic nematode management mainly with biocontrol with *Pasteuria penetrans*, host plant resistance in vegetable, fruit, and agronomic crops, alternative fumigants for methyl bromide, and efficacy of fumigant, nonfumigants, and experimental nematicides. Service includes holding national and state professional offices, and editor of national and international Journal of Nematology

Dr. Germán Sandoya-Miranda, is an assistant professor in breeding and genetics at the University of Florida, received his degree at the University of Vigo – CSIC in Spain in plant breeding and genetics. Germán previously worked as a project scientist at the University of California, Davis and the USDA-ARS, Salinas California in lettuce breeding for a soil-borne pathogen. His current mission is to improve lettuce cultivars for Florida production. He is developing romaine and iceberg lettuce cultivars. In addition, his program is increasing the breeding of boston, leaf and other niche types of lettuce. He is training master and Ph.D. students in plant breeding in the Horticultural Science Department of UF. He

has authored several scientific journal publications and is a member of societies such as ASHS, FSHS, APS, NAPB and internationally EUCARPIA.

Dr. Alfred Huo, Assistant Professor and Plant Breeder, Department of Environmental Horticulture at University of Florida, received his Ph.D. degree in Horticulture Science at University of Georgia. During the past 10 years, he has focused on genetic improvement of horticultural crops with biotechnology tools including tissue culture, mutagenesis and gene-editing. His current research is to utilize these advanced breeding tools to develop ornamental and vegetables that are tolerant to heat, drought and salinity stress.