



THE UNIVERSITY OF ARIZONA

**College of Agriculture
& Life Sciences**

Controlled Environment Agriculture Center

Department of Agricultural &
Biosystems Engineering
School of Plant Sciences



Controlled Environment Agriculture Center

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<http://ag.arizona.edu/ceac/>

2015 Short Course Program

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2015 Greenhouse Crop Production & Engineering Design Short Course

March 22 - 27, 2015

Tucson, Arizona

<https://ag.arizona.edu/ceac/Spring-Short-Course>

Sunday, March 22, 2015, Afternoon

Arrival, Set-Up, Registration, Welcome Reception and 'Get Acquainted' Day

| | |
|----------------|--------------------------------------|
| 2:00 – 5:30 pm | Exhibitor Set-Up |
| 3:30 – 6:00 pm | Registration Table Open |
| 3:30 pm | Exhibitor Gallery Open until 7:30 pm |
| 5:30 pm | Cash Bar Opens |
| 5:30 – 7:30 pm | Welcome Reception |
| 7:30 pm | Invited Speakers Meeting |

Monday, March 23, 2015, Morning

7:00 – 8:00 am Breakfast,

8:00 – 8:15 am Welcome and Introductions: **Gene Giacomelli**

“Plant Production I within Hydroponics & Controlled Environments”

Moderator: Gene Giacomelli

8:15 – 9:00 am Growing systems and the crops they support

Dr. Merle Jensen

9:00 – 9:45 am Plant Factory & Urban Agriculture– Challenges & Opportunities

Dr. Chieri Kubota

9:45 – 10:30 am Seeds & crop varieties – importance of a good start

Dr. Merle Jensen, Greenhouse Vegetable Consultants, LLC

10:30 – 10:45 am Break - Visit your Exhibitors

10:45 – 11:15 am Discussion - Question & Answers

Jensen, Kubota, and Giacomelli

11:15 – 11:45 am 6, 5–minute Exhibitor presentations

11:45 – 12:00 Announcements

12:00 – 1:00 pm Lunch

Monday, March 23, 2015, Afternoon**“Plant Production II within Hydroponics & Controlled Environments”****Moderator: Pat Rorabaugh**

1:00 – 1:45 pm Greenhouse Pest Problems: Common insects, mites & diseases

Dr. Stacy Tollefson

1:45 – 2:30 pm Integrated Pest Management

Karin Tifft, Greenhouse Vegetable Consultants, LLC

2:30 – 3:00 pm Discussion - Question & Answers

Rorabaugh, Tifft, Tollefson

3:15 – 3:30 pm Break, Visit your Exhibitors

3:30 – 3:45 pm 3, 5-minute Exhibitor presentations

3:45 – 4:30 pm Plant Nutrition Basics

Dr. Pat Rorabaugh

4:30 – 5:15 pm Pollination & Bee Management

Dominique Demers, BioBest

5:15 – 5:45 pm Discussion - Question & Answers

Rorabaugh, Demers, and others

Dinner – on your own

Tuesday, March 24, 2015, Morning

7:00 – 8:00 am Breakfast

7:55 – 8:00 am Welcome & Announcements

“Systems & Components I Controlled Environments”

Moderator: Murat Kacira

8:00 – 8:45 am Greenhouse Structures & Design

Dr. Murat Kacira

8:45 – 9:30 am Greenhouse Site Selection

Dr. Pat Rorabaugh

9:30 – 9:45 am Discussion - Question & Answers

Kacira, Rorabaugh

9:45 – 10:00 am 3, 5-minute Exhibitor presentations

10:00 – 10:15 am Break, Visit your Exhibitors

10:15 – 11:00 am Plant Lighting Basics and Applications

Dr. Ricardo Hernandez

11:00 – 11:45 am Environmental Control

TBA

11:45 – 12:00 pm Discussion - Question & Answers

Hernandez, TBA

12:00 – 1:00 pm Lunch

Tuesday, March 24, 2015, Afternoon (WEES Session)**Moderator: Gene Giacomelli**

1:00 – 1:45 pm Tunnels: From Hoop Houses to High Technology

John Hoogeboom, Rough Greenhouses

1:45 – 2:30 pm Energy Conservation & Strategies

Dr. Gene Giacomelli

2:30 – 3:00 pm Discussion - Question & Answers

Giacomelli and Hoogeboom

3:00 – 3:15 pm Break Visit your Exhibitors

3:15 – 4:00 pm Greenhouse Controls & Fertigation

Dr. Gene Giacomelli

4:00 – 4:45 pm Alternative Energy Integrated CEA Systems

Dr. Murat Kacira

4:45 – 5:15 pm Discussion - Question & Answers

Giacomelli, Kacira

5:15 – 6:30 pm WEES and CEAC Mission Award Reception

Wednesday, March 25, 2015, Morning

7:00 – 8:00 am Breakfast

7:55 – 8:00 am Welcome & Announcements

“Alternative Systems and Crops for Controlled Environments”

Moderator: Kevin Fitzsimmons

8:00 – 8:45am Intro to Aquaponics in Arizona

Dr. Kevin Fitzsimmons

8:45 – 9:30am An Engineers View of Recirculating Aquaculture and Aquaponic Systems

Dr. James Ebeling

9:30 – 9:45am Discussion - Question & Answers

Fitzsimmons, Ebeling

9:45 – 10:00am Coffee Break

10:00 – 10:45am Strawberry Production

Dr. Chieri Kubota & Mark Kroggel

10:45 – 11:30am Food Safety

Kurt Nolte

11:30 – 12:00pm Discussion - Question & Answers

Kubota, Kroggel, Nolte

12:00 – 1:00 pm Lunch

Wednesday, March 25, 2015, Afternoon**“Experiences in Production, Marketing and Business Establishment”****Moderator: Merle Jensen**

1:00 – 1:45 pm Business Basics

Myles Lewis

1:45 – 2:30 pm Day In The Life Of A Grower

Ken Gerhart, Greenhouse Vegetable Consultants, LLC

2:30 – 3:00 pm Discussion - Question & Answers

Jensen, Gerhart, Lewis

3:00 – 3:15 pm Break, Visit your Exhibitors

3:15 – 4:00 pm Succeeding as a Small Greenhouse Grower

TBA

4:00 – 4:45 pm Hi Tech- Hi Touch: From Farm Markets to Supermarkets

Merle Jensen, Greenhouse Vegetable Consultants, LLC

4:45 – 5:15 pm

Discussion - Question & Answers

Jensen, TBA

Dinner – On Your Own

Thursday, March 26, 2015**Hands-on Workshops at CEAC**

7:00 – 8:00 am Breakfast

8:00 am Bus Leaves hotel for CEAC Workshops

8:30 – 10:15 am ROUND ONE WORKSHOPS [select one]

- ☐ Basics of Fertigation : **Steve Poe, Neal Barto**
- ☐ Tomato Crop Maintenance Using High Wire Systems : **Pat Rorabaugh**
- ☐ Growing Lettuce and Herbs in Floating System: **Will Kacheris, Erica Hernandez**
- ☐ Sensors and Controls Basics : **Murat Kacira, Fei Jia**
- ☐ My First Greenhouse : **Gene Giacomelli**

10:15 – 12:00 pm ROUND TWO WORKSHOPS [select one]

- ☐ Basics of Fertigation : **Steve Poe, Neal Barto**
- ☐ Tomato Crop Maintenance Using High Wire Systems : **Pat Rorabaugh**
- ☐ Growing Lettuce and Herbs in Floating System : **Will Kacheris, Erica Hernandez**
- ☐ Sensors and Controls Basics : **Murat Kacira, Fei Jia**
- ☐ My First Greenhouse : **Gene Giacomelli**

12:00 – 1:00 pm Lunch at CEAC

1:00 – 2:45 pm ROUND THREE WORKSHOPS [select one]

- ☐ Basics of Fertigation : **Steve Poe, Neal Barto**
- ☐ Tomato Crop Maintenance Using High Wire Systems : **Pat Rorabaugh**
- ☐ Growing Lettuce and Herbs in Floating System : **Will Kacheris, Erica Hernandez**
- ☐ My First Greenhouse : **Gene Giacomelli**

2:45 – 4:45 pm **Extra Round – [select any/all]**

- ☐ TBA : **Murat Kacira**
- ☐ Applications of LED Lighting : **Ricardo Hernandez**
- ☐ Grafting : **Chieri Kubota**
- ☐ Informal Meetings/Discussions for previous Workshops [attend any/all]

Tomato Crop Production- **Pat Rorabaugh**

Lettuce/Herb Production- **Will Kacheris, Erica Hernandez**

4:45 pm Visit to Aquaponics Greenhouse

Dr. Kevin Fitzsimmons

6:30 pm Return to Westward Look

Dinner – On Own

Friday, March 27, 2015

7:00 – 8:00 am Continental Breakfast

OPTIONAL COMMERCIAL GREENHOUSE TOUR [fee required]

8:00 am Leave Hotel for Commercial Greenhouse Tour

Lunch Box lunch provided on return route

2:00 pm Estimated return to Hotel

Dinner – on own