



Controlled Environment Indoor and Vertical Food Production Coordinated Research Conference

Program Schedule and Format

There are 7 Theme sessions of 1-hour each, with 4 on Tuesday, September 10 and 3 sessions on Wednesday, September 11. Each 1-hour session includes an Invited Keynote Speaker, an additional Invited Speaker, and a Panel.

Format of each 1-hour Theme Keynote Session [#1 - #7]

Keynote Speaker	15 min	sets stage for discussions
Invited Speaker	10 min	adds breadth to the topic
Q & A	05 min	[or buffer time, if needed]
Panel	15 min	3 people add discussion to the topic; facilitated by prescribed questions provided to the panel members
Q & A	15 min	Mixed into panel discussion and afterwards; brings audience into the program
Total	60 min	

Each of the seven Keynote Theme sessions include:

Invited Keynote – Leading the presentations in the plenary sessions and facilitating the breakout sessions for each topic, which include: Economics, Engineering, Production Systems, Plant Breeding, Pest and Disease Management, Food Nutrition and Safety, and Industrial Ecology in Closed systems. [15 minutes]

Invited Speaker – Providing a presentation immediately after the Keynote that will broaden the discussion. [10 minutes]

3 Panel Members – Discussion panel begins immediately after the Invited Speaker. Facilitated with questions prepared and proposed to the panel in advance [30 minutes]. Includes Q&A interactive discussion with entire audience, as well as Invited Speakers.

5 [minimum] Attendee Members – All attendees will participate within the afternoon breakout sessions which may have 12 – 15 Attendee Members and will include the Invited Keynotes and Invited Speakers for each breakout session topic. We expect a total of 75 – 80 active participants at the conference.

Program Schedule

Sunday, Sept 8 – Travel Day [for some]. Arrive and enjoy Tucson. <https://www.visittucson.org/>
Housing available at Biosphere 2.

Monday, Sept 9 – Travel Morning [for some]. Introduction Bus tour to greenhouse

- 11:45 am Gather for bus departure from Biosphere 2 at 12:00 noon
- Visit local greenhouse production facility [TBD]
- Get to know each other on the bus; Box lunch provided.
- 5:00 pm Arrive Biosphere 2 for Welcome Reception and Drinks and Dinner

Tuesday, Sept 10 – Day 1 Conference

- 8:00 – 8:15 Opening Statements about Conference
- 8:15 – 9:15 Keynote #1 Economics
[see example detail of each Keynote Theme session]
- 9:15 – 10:15 Keynote #2 Production Systems
- 10:15 – 10:30 *coffee break*
- 10:30 – 11:30 Keynote #3 Industrial Ecology in Closed Systems
- 11:30 – 11:45 *coffee break*
- 11:45 – 12:45 Keynote #4 Engineering
- 12:45 – 2:00 *Lunch provided*
- 2:00 – 2:10 Introduction to the Breakout Sessions - Sarah
- 2:10 – 4:00 Breakout Sessions #1 w/self-regulating coffee breaks
Each session will be facilitated by member of the organizing committee and a selected attendee;
and, documented by student recorder
- 4:00 – 5:00 Reporting from Breakout Sessions to entire conference group
- 5:00 – 8:00 Drinks and Dinner provided at Biosphere 2

Wednesday, Sept 11 – Day 2 Conference

- 8:00 – 8:15 Opening Statements about Conference
- 8:15 – 9:15 Keynote #5 Breeding
- 9:15 – 10:15 Keynote #6 Food Nutrition and Safety
- 10:15 – 10:30 *coffee break*
- 10:30 – 11:30 Keynote #7 Pest and Disease Management
- 11:30 – 11:45 *coffee break*
- 11:45 – 12:45 Lightning Talks – 5 min highlights
- 12:45 – 2:00 *Lunch provided*
- 2:00 – 3:30 Break Sessions #2 w/self-regulating coffee breaks
- 3:30 – 5:00 Reporting from Breakout Sessions to entire conference group
- 5:30 – 6:00 Depart Biosphere 2 by bus to UA Controlled Environment Agriculture Center
No return to Biosphere 2. Must bring all travel materials and luggage.
- 6:00 – 8:30 Bar-be-que Dinner and tour of UA-CEAC provided by students, faculty, staff and
industry supporters.
- 8:30 Bus departs for Lodge on the Desert and for Tucson Marriott University Park.
Must make your own reservations.

Thursday, Sept 12 – Optional

- 9:00 – 12:00 Working Group on Proposal Development
Meeting held at Lodge on the Desert. <https://www.lodgeonthedesert.com/en-us>

Theme Topics

The Az-CEA Conference will center its program and discussions on the following major R&D areas, or Theme topics, each to identify cross-disciplinary areas of synergy, challenges, opportunities and needs for research. Some fundamental questions are noted for each theme.

Economics – what are good metrics of success in these systems from both industry and community perspectives? Can we develop a pipeline to quantify environmental and social benefits of these systems in a Benefit-Cost Analysis framework? How scalable are these systems? What are environmental impacts, life cycle analyses? What education does the consumer need to better appreciate vegetables and fruits produced from CEA production? How can markets be expanded?

Production Systems - how to manage crops to integrate with improve environmental controls, nutrient delivery and automation. How to improve plant architecture to enhance crop productivity and reduce waste? How to improve logistics and enhance labor efficiency? How can these systems be modified to enhance post-harvest and the market value of products?

Industrial Ecology in Closed Systems – how can these systems be scaled and promoted such that their products are economically accessible to all consumers? How will they function within urban and rural food sheds in terms of supply chain and job creation? What are the implications of these systems for natural resource stewardship and climate?

Engineering – how to increase lighting efficacy, light use efficiency, and reduce cost? How to control and modulate CO₂? How to design and enhance air circulation and to optimize HVAC? How to minimize labor input and integrate innovative automation and robotic systems? How to improve water use efficiency and cycling?

Plant Breeding – what makes a crop a good candidate for indoor farming/what are priority candidate crops for these systems beyond what is currently grown? What traits should be privileged in breeding programs for indoor farming? How can gene editing and genomic techniques be leveraged to integrate novel financial opportunities into these growing systems, such as increased nutritional content, enhanced water, nutrients and light use efficiencies, or pharmaceutical production? How CEA production systems can alter the structure of microbial communities associated with plants, growing media, and determine how the alterations affect plant nutrient and water uptake and utilization?

Food Nutrition and Safety – how alterations to growing media and environment will impact food quality, flavor, nutrition content and food safety? How do indoor growing conditions alter the microbial communities of plants? How do they impact product quality and shelf life?

Pest and Disease management – what are the major viral, fungal, and bacterial pathogens and insect pests in these systems and how are they best addressed? Integrate Pest Management for reduced chemical control? How to develop and implement a rapid and simple digital imaging system for pest and disease diagnosis? How to improve the efficiency of pest and disease management while not harming beneficial insects and pollinators?