Schedule is subject to change

January 2017 UA/CEAC Intensive Hydroponic Greenhouse Crop Production Course
1951 East Roger Road, Tucson, AZ 85719
http://ceac.arizona.edu/ 520-626-9566

EMPHASIS ON TOMATOES: Instructor – Stay Tollefson, Ph.D.
The tomato course will use the PLS 217 class manual as a reference.
Course materials: Flash drive with PLS 217 manual, power points
Folder with handouts, loupe & supplies

MONDAY January 2, 2017 – Tomato
3:00 – 5:30 pm  Check-in at the CEAC – CEAC Classroom
5:00 – 5:30 pm  Brief tour of the CEAC / CAC facilities
5:30 – 6:30 pm  Light dinner at CEAC – CEAC Classroom
6:30 – 8:00 pm  Introduction to CEA and Hydroponics – CEAC Classroom
    • A little history (Chapter 1)
    • The plant and its needs (Chapters 2, 3)
    • Basic hydroponic systems (Chapter 5)

TUESDAY January 3, 2017 – Tomato
9:00 – 9:15 am  Discussions and questions from previous day – CEAC Classroom
9:15 – 10:00 am A bit about plant propagation (Chapter 6) – CEAC Classroom
10:00 – 11:00 am Tour of the Controlled Environment Agriculture Center (CEAC) including:
    • Mist house (more on plant propagation)
    • Teaching Greenhouse (intro to the greenhouse, control systems, experiment, greenhouse set-up) (Chapter 3)
    • Tomato plant rep assignments for the course
11:00 – 12:00pm Greenhouse set-up (Chapter 3) – CEAC Classroom
    • Basic components including environmental settings
    • Crop layout
    • Crop scheduling
12:00 – 1:00 pm  Lunch provided – CEAC Classroom
1:00 – 2:00 pm  Crop maintenance – Emphasis on tomatoes (Chapter 3) – CEAC Classroom
    • Training & pruning
    • Physiological disorders – leaves, stems, trusses (briefly, fruit)
    • Factors controlling plant architecture
2:00 – 4:00 pm  Plant work: crop training & pruning – CEAC Teaching Greenhouse  
    • Finding the tomato head – Stem clipping & pruning  
    • Nodes, internodes and location of leaves & clusters on the stem  
    • Leaning & Lowering – proper techniques

4:00 – 5:30 pm  Controlling plant architecture – CEAC Teaching Greenhouse  
    • “Steering” your plants to success (Chapter 3)  
    • Exercise: recognizing vegetative vs reproductive characteristics

5:30 pm  Dinner on your own

**WEDNESDAY January 4, 2017 – Tomato**

9:00 – 9:15 am  Discussion and questions from previous day – CEAC Classroom

9:15 – 10:00 am  Crop registration forms – CEAC Classroom  
    What to measure & what it means

10:00 am – 12:00 pm  Crop registration – measurements – CEAC Teaching Greenhouse  
    Analysis of measurements

12:00 – 1:00 pm  Lunch provided – CEAC Classroom

1:00 – 2:30 pm  Flowers, pollination and the fruit – CEAC Classroom  
    • Bee hives / bee management (Chapter 7)  
    • Cluster maintenance (Chapter 8)  
    • Fruit problems (fresh fruit & Chapter 3)  
    • Harvest / grading / storage (Chapter 8)

2:30 – 4:00 pm  Harvesting and grading – CEAC Teaching Greenhouse  
    • Individual versus cluster (TOV) harvesting  
    • Fruit categories including fruit problems  
    • Weighing & record keeping  
    • Types of packaging

4:00 – 5:30 pm  Flowers to fruit – CEAC Teaching Greenhouse  
    • Exercise: Pollination % calculations – are the bees working?  
    • Cluster maintenance – pruning & clipping

5:30 pm  Dinner on your own.
THURSDAY January 5, 2017 - Tomato

9:00 – 9:15 am  Discussions and questions from previous day – CEAC Classroom

9:15 – 12:00 pm  Plant protection – CEAC Classroom (Chapter 4)
  •  Introduction to the pests: Insects, Mites & Diseases
  •  Integrated pest management (IPM)

12:00 – 1:00 pm  Lunch provided – CEAC Classroom

1:00 – 2:00 pm  Plant work – CEAC Teaching Greenhouse
  •  Leaves & leaflets – Removing lower leaves, how and why.

2:00 – 4:00 pm  Plant protection / Keeping plants healthy – CEAC Teaching Greenhouse
  •  Exercise: Pest ID & scouting
  •  Record keeping for pest problems

4:00 – 5:30 pm  A bit about business – CEAC Classroom
  •  Costs & sources for tomato production items
  •  Introduction to GHP / GAP certification notebooks for tomato

5:30pm  Dinner on your own

FRIDAY January 6, 2017 – Tomato

9:00 – 9:15 am  Discussion and questions from previous day

9:15 – 11:00 am  Plant nutrition basics – CEAC Classroom
  •  Tomato nutrients & deficiencies (Chapter 9)
  •  Nutrient delivery systems (Chapter 10)

11:00am – 12:00 pm  TOUR: Nutrient delivery systems in different greenhouses

12:00 – 1:00 pm  Lunch provided

1:00 – 3:00 pm  Nutrient recipes & calculations (Chapter 10) – CEAC Classroom
  •  Exercise: nutrient solution calculations

3:00 – 4:00 pm  Making the concentrated solutions – CEAC Teaching Greenhouse
  •  Components (keeping things separate), weighing & mixing the tanks

4:00 – 5:30 pm  Group Ex. - What’s the problem here? Plus Q & A – CEAC Classroom

5:30 pm  Dinner on your own
SATURDAY January 7, 2017 – Combined Tomato & Lettuce

9:00 – 11:00 am  Greenhouse Basics (Tollefson)
- Greenhouse site selection (Chapter 11)
- Greenhouse designs & materials (Chapter 12)
- Environmental control – including sizing heaters & fans (Chapter 13)
- A bit about greening the greenhouse (Chapter 14)

11:00 – 12:00 pm  Round table discussion with greenhouse engineers
Includes professors of Agricultural & Biosystems Engineering Department at The University of Arizona and CEAC / CAC personnel (as available):
- Will include Gene Giacomelli, Ph.D. and Murat Kacira, Ph.D.

12:00 – 1:00 pm  Lunch provided & Round table continues – CEAC Classroom

1:00 – 2:30 pm  Environmental control requirements (Tollefson & Lewis)
- Set-points (both tomato & lettuce)
- How the environment effects the plants and vice versa
- Real-time monitoring – CEAC/tomatoes live
- Deciphering your greenhouse – “Virtual Grower”

2:30 – 4:30 pm  Food safety & GHP/GAP certification (Lewis)
- Safe production & handling procedures

4:30 – 5:45 pm  Organic Hydroponic Production (Tollefson)

6:00 – 8:00 pm  Dinner provided by CEAC for all attendees of BOTH groups
- Dinner speaker: Merle Jensen, Ph.D.