Schedule is subject to change

June 2017 UA/CEAC Hydroponic Greenhouse Intensive Workshops

Hydroponic Workshops at The University of Arizona

HYDROPONIC TOMATO PRODUCTION
Instructor – Dr. Stacy Tollefson
Controlled Environment Agriculture Center
1951 East Roger Road Tucson, Arizona 85719

Course materials: Google Drive Access to class materials.
Folder with handouts and supplies.
Closed-toe shoes, hat, sunscreen.

Stacy Tollefson is our newly appointed CEAC Faculty. She received her Ph.D in Agricultural & Biosystems Engineering, Hydroponic Vegetable Production and Pest Management in December 2014. Currently she works with the UofA-CEAC teaching Introduction to Hydroponics and Greenhouse Pest Management, as a Farm Manager for Maggie’s Farm Arizona, and additionally sits on USDA Hydroponic Taskforce.

Dr. Tollefson gained experience as the Greenhouse Manager for Dr. Rorabaugh’s teaching greenhouse for 2 years overseeing pest and disease management for that greenhouse and other CEAC projects. She was a USDA National Needs Fellow for 3 years and an NSF GK-12 Fellow for 1 year. Her interests include integrated pest management, organic production methods, aquaponics, and education and outreach.

Stacy Tollefson, PhD
Light Breakfast Refreshments Provided

**MORNING SESSION**

Welcome and Introductions Tour of the 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
- Harvesting

*Back to CEAC Classroom for From Seed to Harvest video (30 min)*

Plant propagation (Chapter 6)
- The Teaching Greenhouse set-up and experiment
- How to harvest

Lunch provided (12:30-1:30PM)

**AFTERNOON SESSION**

Greenhouse set-up (Chapter 3 - PART 1)
- Crop layout & Crop scheduling

Crop maintenance – Emphasis on tomatoes (Chapter 3 PART 2) –
- Training & pruning, finding the head, growth tapes
- Physiological disorders – leaves, stems, trusses (briefly, fruit)
- Factors controlling plant architecture

Plant work: crop training & pruning
- Finding the tomato head – Stem clipping & pruning
- Putting up growth tape
- Nodes, internodes and location of leaves & clusters on the stem
- Leaning & Lowering – proper techniques

Controlling plant architecture
- “Steering” your plants to success (Chapter 3)
- Exercise: recognizing vegetative vs reproductive characteristics
Light Breakfast Refreshments Provided

**MORNING SESSION**

Environmental settings (Chapter 3 PART 3)

Monitoring Growth - What to measure & what it means
  - Crop registration forms

Monitoring Plant Health/Nutrition
  - Lysimeters, water & plant tissue analyses

Crop registration and growth tape measurements

Lunch provided (12:30-1:30PM)

**AFTERNOON SESSION**

Flowers, pollination and the fruit
  - Bee hives / bee management (Chapter 7)
  - Cluster maintenance (Chapter 8)
  - Fruit problems (Chapter 3)

Harvesting/grading/storage
  - Individual versus cluster (TOV) harvesting
  - Fruit categories including fruit problems
  - Weighing & record keeping
  - Types of packaging

Flowers to fruit
  - Exercise: Pollination % calculations – are the bees working?
  - Cluster maintenance – pruning, clipping, j-hooks
Light Breakfast Refreshments Provided

**MORNING SESSION**

Discussions and questions from previous day

Plant protection (Chapter 4)
- Introduction to the pests: Insects, Mites & Diseases
- Integrated pest management (IPM)

Lunch provided

**AFTERNOON SESSION**

Plant work in Greenhouse
- Leaves & leaflets – Removing lower leaves, how and why.

Plant protection / Keeping plants healthy
- Exercise: Pest ID & scouting
- Record keeping for pest problems

A bit about business
- Zoning issues
- Loans versus grants, proforma
- Costs & sources for tomato production
Thursday June 8, 2017 8am – 6pm

MORNING SESSION

Discussion and questions from previous day

Plant nutrition basics
- Tomato nutrients & deficiencies (Chapter 9)
- Nutrient delivery systems (Chapter 10)

TOUR: Nutrient delivery systems in different greenhouses

AFTERNOON SESSION

Nutrient recipes & calculations (Chapter 10)
- Exercise: nutrient solution calculations

Making the concentrated solutions
- Components (keeping things separate), weighing & mixing the tanks

Group Exercise - What’s the problem here? Plus Q & A
Friday June 9, 2017 8am – 6pm

**MORNING SESSION**

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)

Plant protection (Chapter 4)
- Introduction to the pests: Insects, Mites & Diseases
- Integrated pest management (IPM)

*Lunch provided* during round table discussion with greenhouse engineers
- Includes professors of Agricultural & Biosystems Engineering Department at The University of Arizona and CEAC / CAC personnel (as available): Dr. Gene Giacomelli, Dr. Murat Kacira, Mark Carson.

**AFTERNOON SESSION**

Food safety & GHP/GAP certification (Lewis)
- Safe production & handling procedures

Organic Hydroponic Production (Tollefson)
- Certification issues
- Production methods and issues

Business Considerations (Lewis & Tollefson)

Questions?
Contact Austin at CEAC Front Desk
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