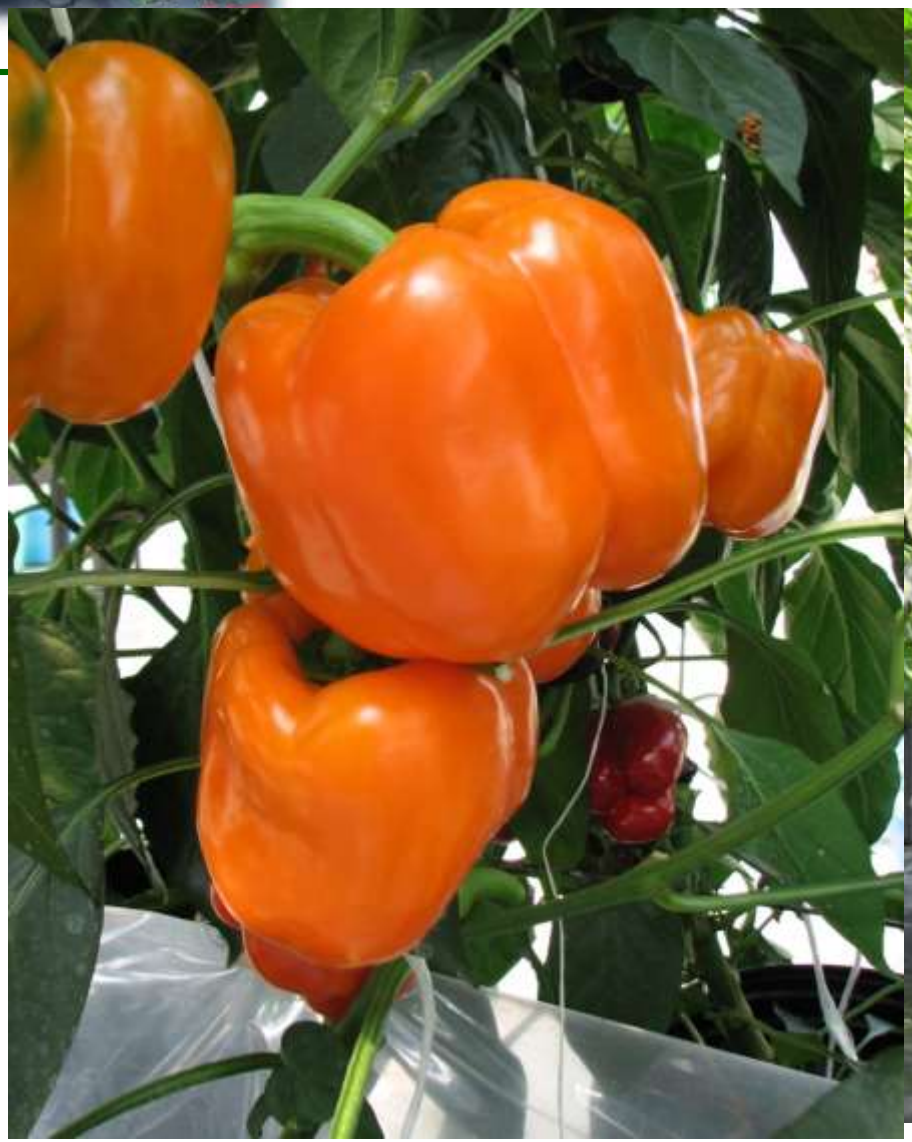

UF UNIVERSITY of FLORIDA
IFAS Extension
Extending The Season Under Open Shade Systems
R. Hochmuth, W. Laughlin, B. Martin, and D. Fenneman

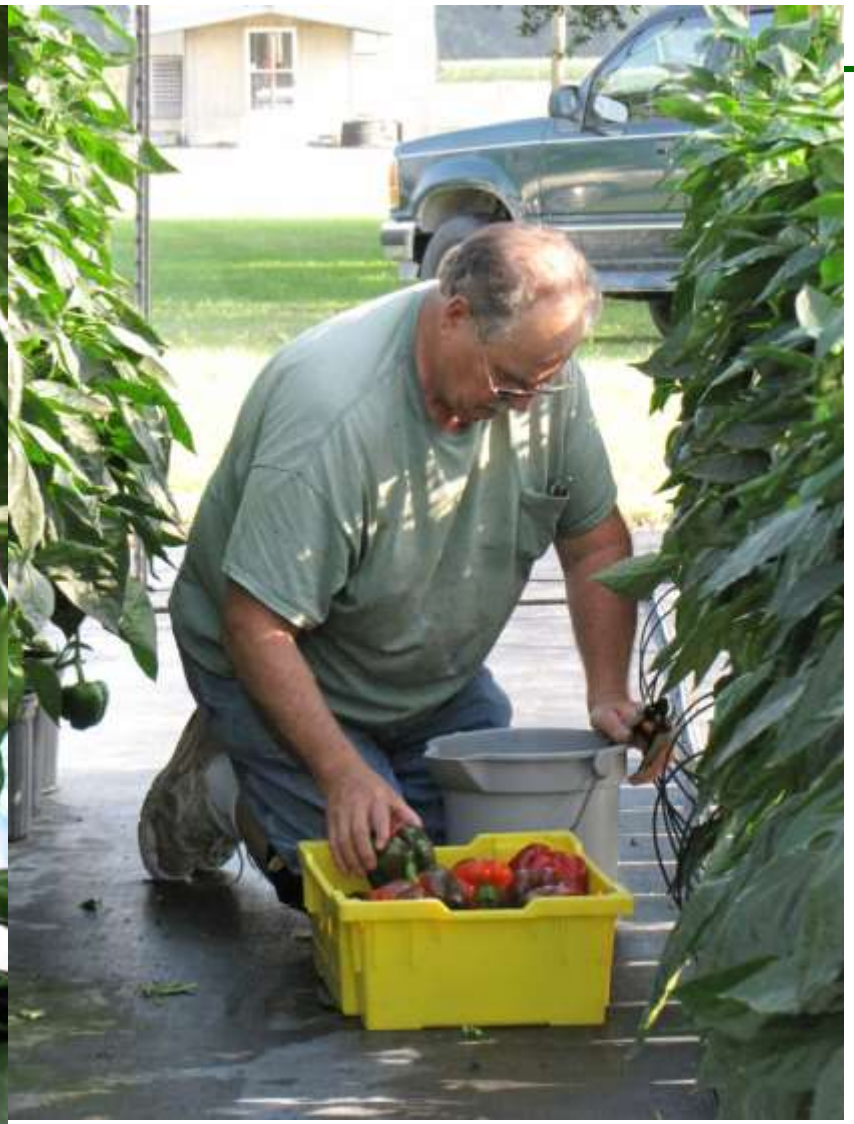
What Can a Protected Culture Structure Do For YOU?

Inside a Greenhouse????

Inside an Unheated High Tunnel

Under an Open Shade Structure????





What is the purpose of a structure in protected culture?

- Use of technology and materials to provide protection of a crop
- Protection from:
  - Temperature Extremes (High and Low)
  - Excessive Sunlight
  - Insects
  - Wildlife Pests
  - Diseases
  - Wind
  - Rainfall
  - Moisture, Dew, etc.
  - Now….Food Safety Advantages

Note: Often uses agricultural plastics = Plasticulture

Examples of Technologies and Materials

- Plastic Mulch And Drip Irrigation
- Frost Covers, Row Covers
- Temporary Covers plus Misters (Microjets)
- Low Tunnels (1-2 feet high)
- High Tunnels, Walk-in Tunnels, Hoop Houses (usually about 8-15 ft high)
- Shade Culture
- Greenhouses (heating, cooling, shading, etc)
- Fan and Pad vs. Passively Ventilated
- Pest Exclusion (screening and metalized mulch)

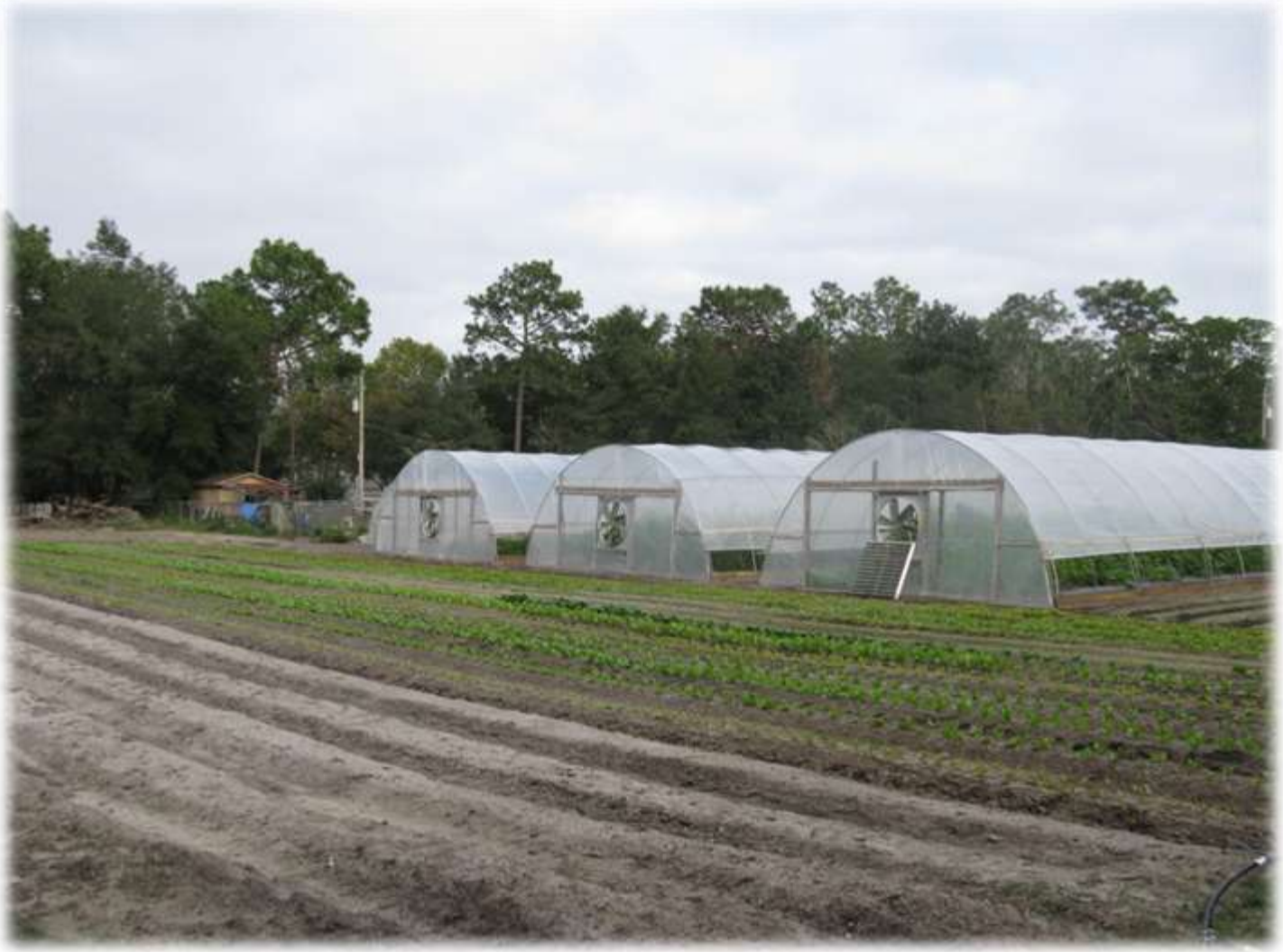
Simplest Forms of Protection
Row Covers

Preparing for Using Row Covers as Low Tunnels for Freeze Protection

(Notice: #9 gauge wire for hoops

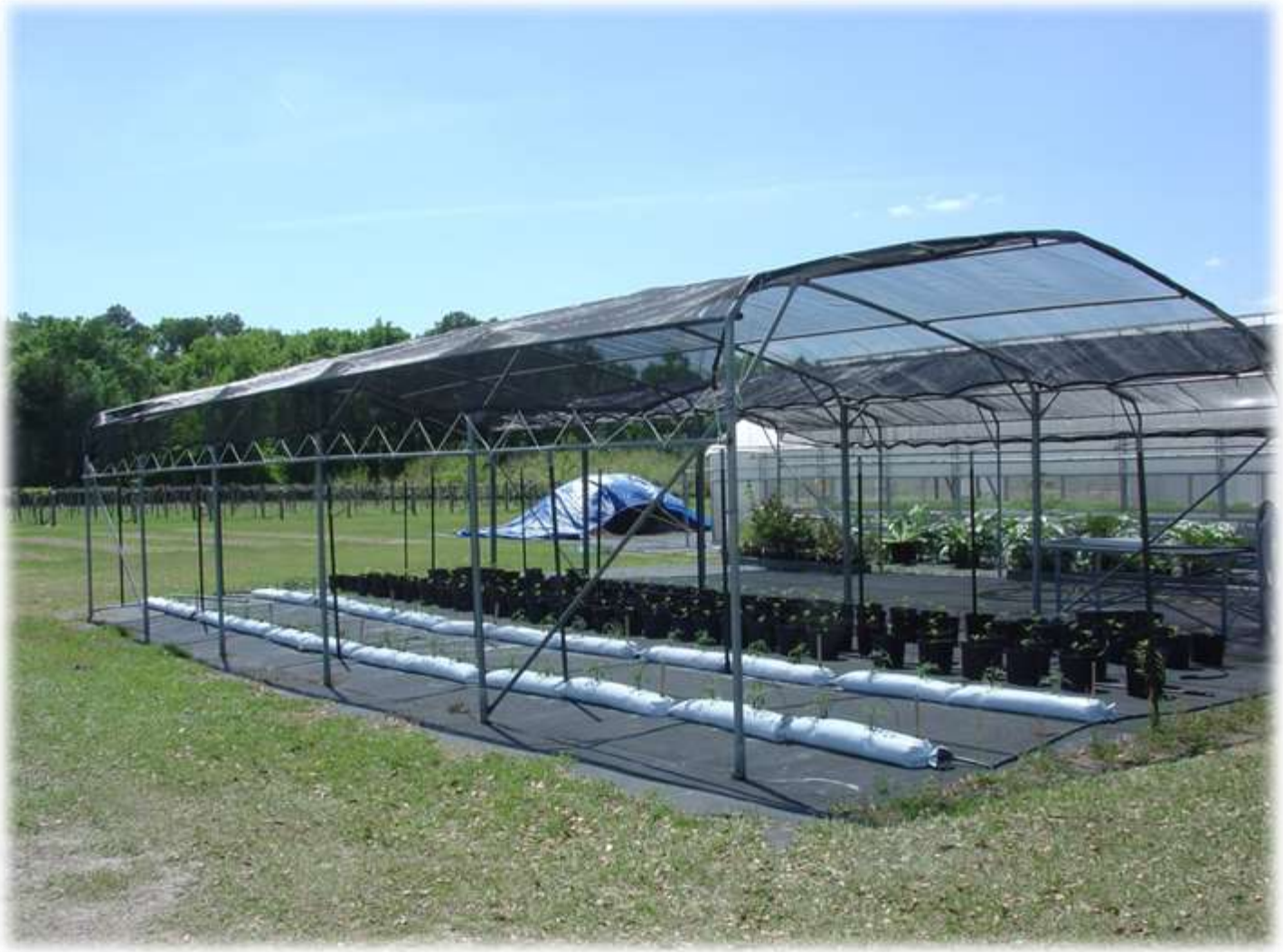
Hydroponic Strawberry Outdoors in North Florida

High Tunnels/Walk-In Tunnels/Hoop Houses

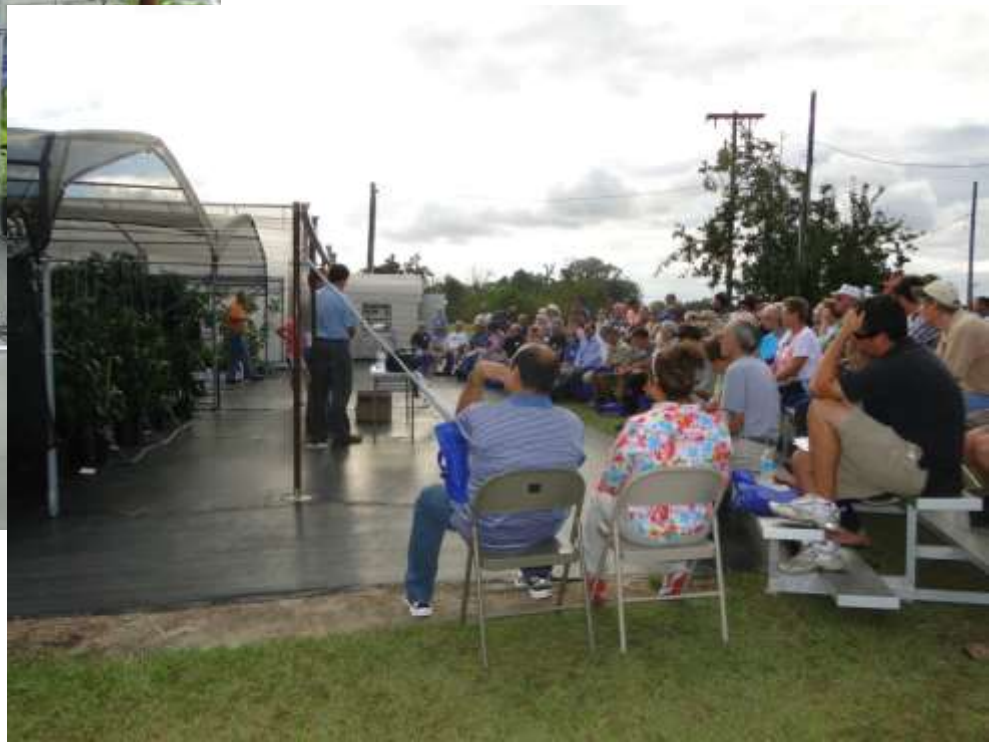


Organic Production Systems in High Tunnels

Open Shade Culture to Extend into the Summer in Florida



High Interest in Simple Hydroponics Under Shade



Hydroponic Peppers in a Shade House for Summer Production in North Florida

Background- Florida Peppers

- Historically 20,000 acres field grown in Florida
- Available October – July
- July – September
  - High temperatures
  - High humidity
  - Frequent rainfall
  - Pest pressure high

- Colored pepper very difficult to grow outdoors in Florida
- Field and greenhouse production Jul-Sept very difficult

Summer Pepper Production??

- Large field acreage not
- competitive in mid summer
- However, small farmers and direct marketing…??
- Small farmers
  - Direct market
  - Demand for local products
  - Seek to extend season for
  - local markets

NFREC- Suwannee Valley Pepper Trials- Materials & Methods

- 40 x 40 ft shade structure
- 10 ft high
- 40% polypropylene shade cloth
- 3 gallon plastic pots
- Composted pine bark media
- Heritage ‘VR’ pepper plants (TSWV resistant)
- Standard hydroponic nutrient solution
- Support system – fence posts and bamboo poles with string to standard trellis

Original Double Row System

Peppers Under Shade- Mid June

Complication of Trellis System

Single Row System, New Trellis, Two Leaders

Shade Pepper Crop in November (8 Months)

Harvest Results

- Harvests June 16 – November 9, 2006
- Total Marketable = 4,139 boxes/A
  - Fancy = 3,460 boxes/A
  - US No 1 = 477 boxes/A
  - US No 2 = 202 boxes/A

Fruit Size

Harvest Dates	Average Fruit Width (in)[z]
16 Jun	3.67
23 Jun	3.63
10 Jul	3.54
27 Jul	3.47
18 Aug	3.00
12 Sep	3.13
13 Oct	3.35
9 Nov	3.30

[z] Average fruit width was determined by measuring 15 randomly selected fruits from the US Fancy category. Measurements were taken across the base of the fruit near the stem end, the widest part of the fruit.

Conclusion

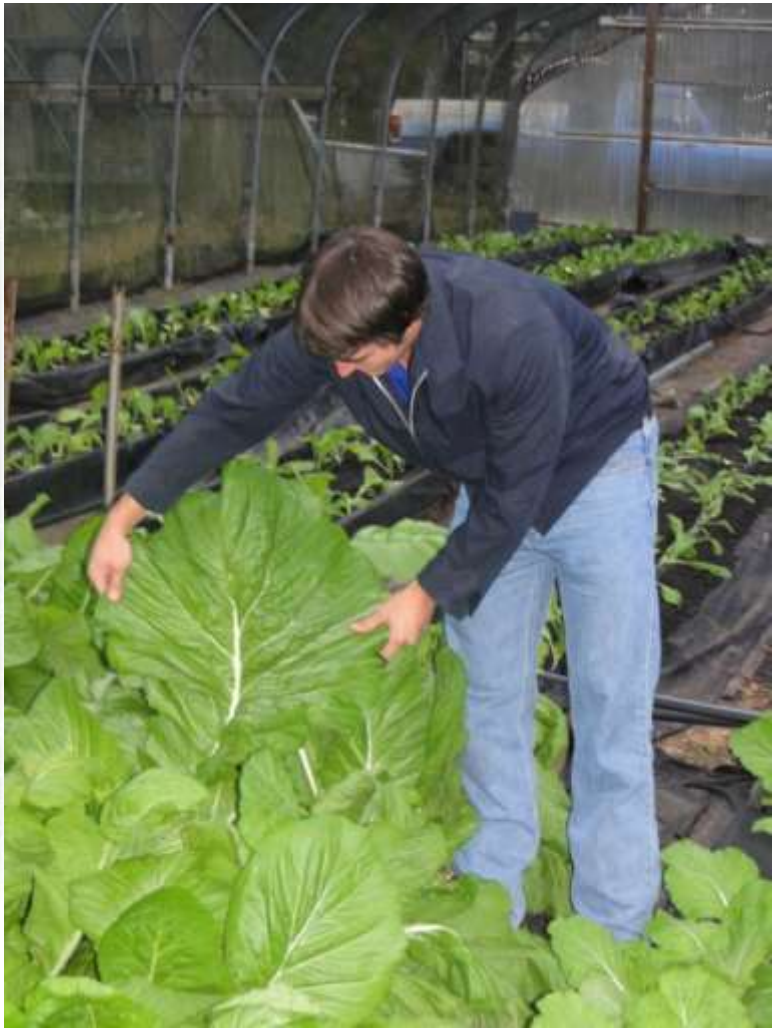
- **Open shade culture can serve to extend pepper production into the summer in Florida**
- **High quality fruit June-November**
- **Fruit size decreases in late summer, may not meet standards for wholesale markets**
- **Plasticulture techniques make it possible**
  - Shade cloth
  - Ground cover
  - Growing pots
  - Irrigation system
  - Polypropylene twine
  - Industry network

Key Point: Measure light levels under shade materials

Open Shade for Mixed Vegetable Production in the Winter in South Florida

Mixed Crop, Direct Market, Under Shade

Greens under shade
What, NO SAND!



Specialty Leafy Greens

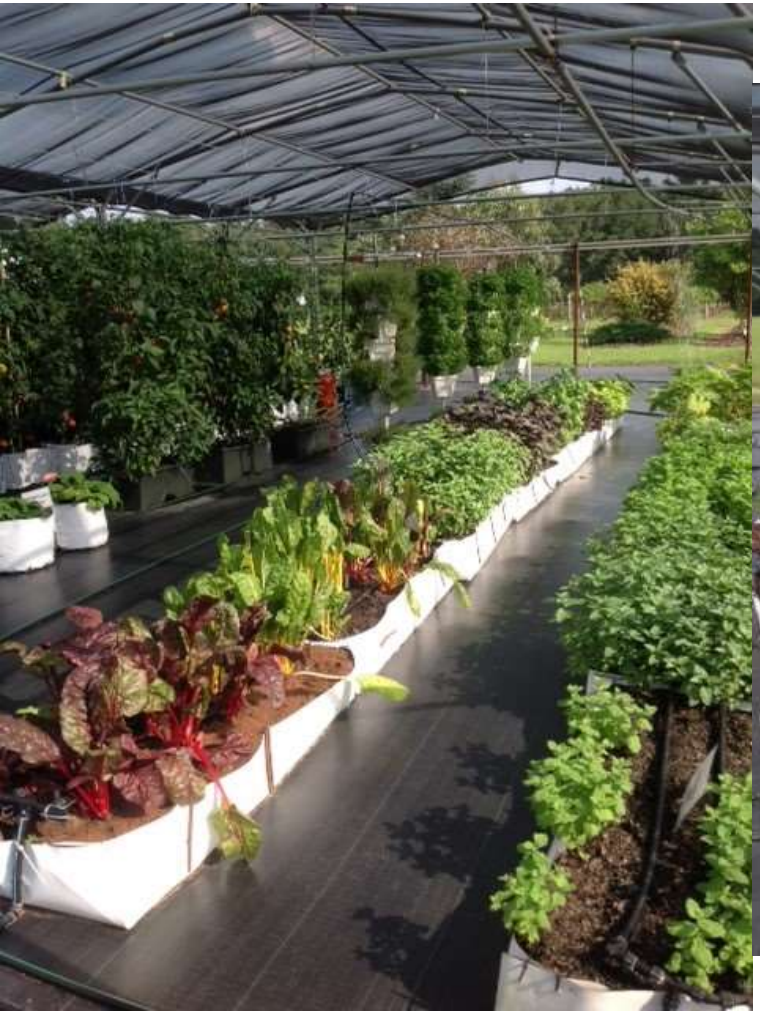
Summer Kale Under Shade

Leafy Greens and Herbs

Leafy Greens

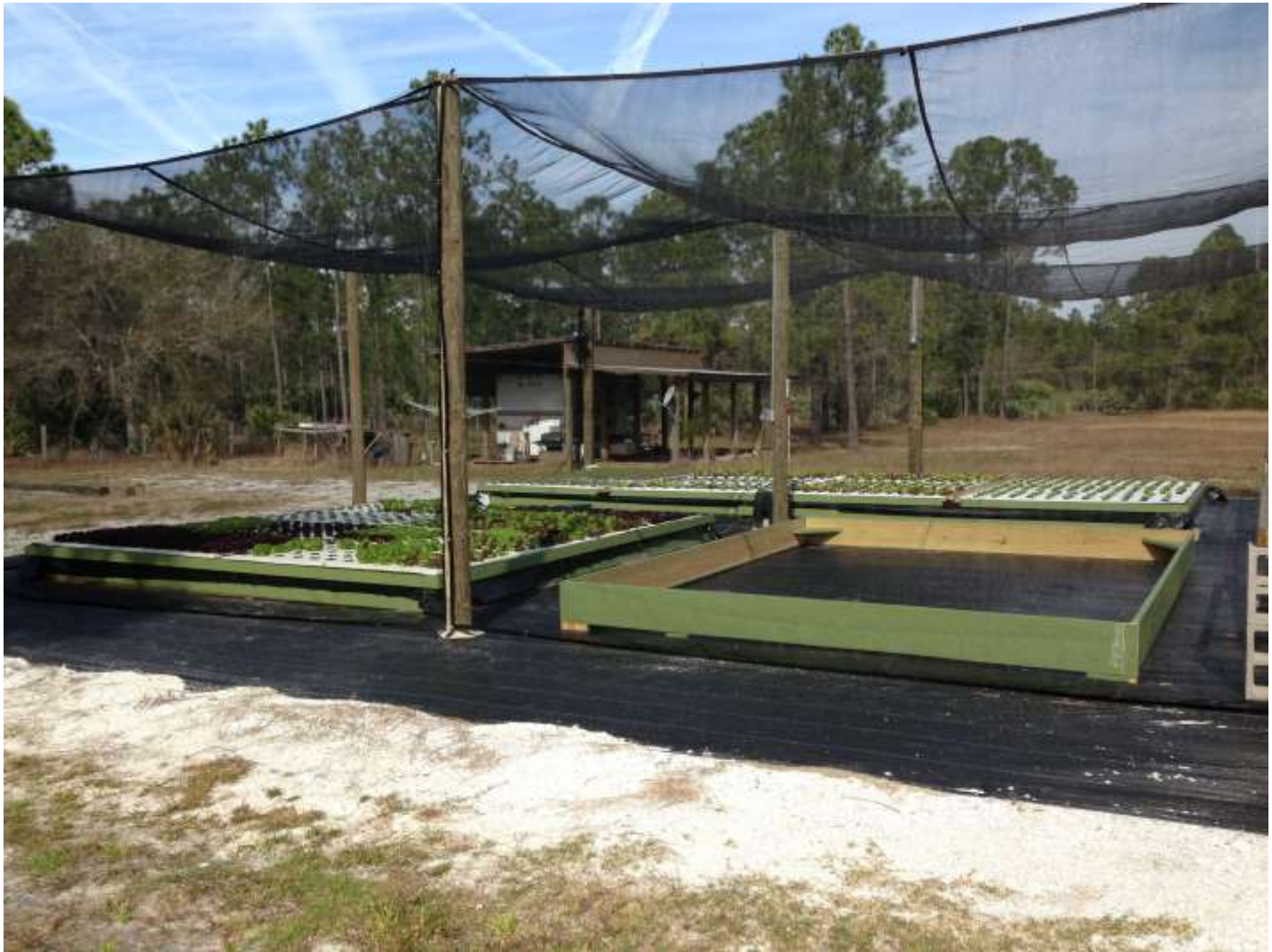
Mixed Crops Under Shade for Direct Markets and Restaurants

Mixed Specialty Crops Under Shade

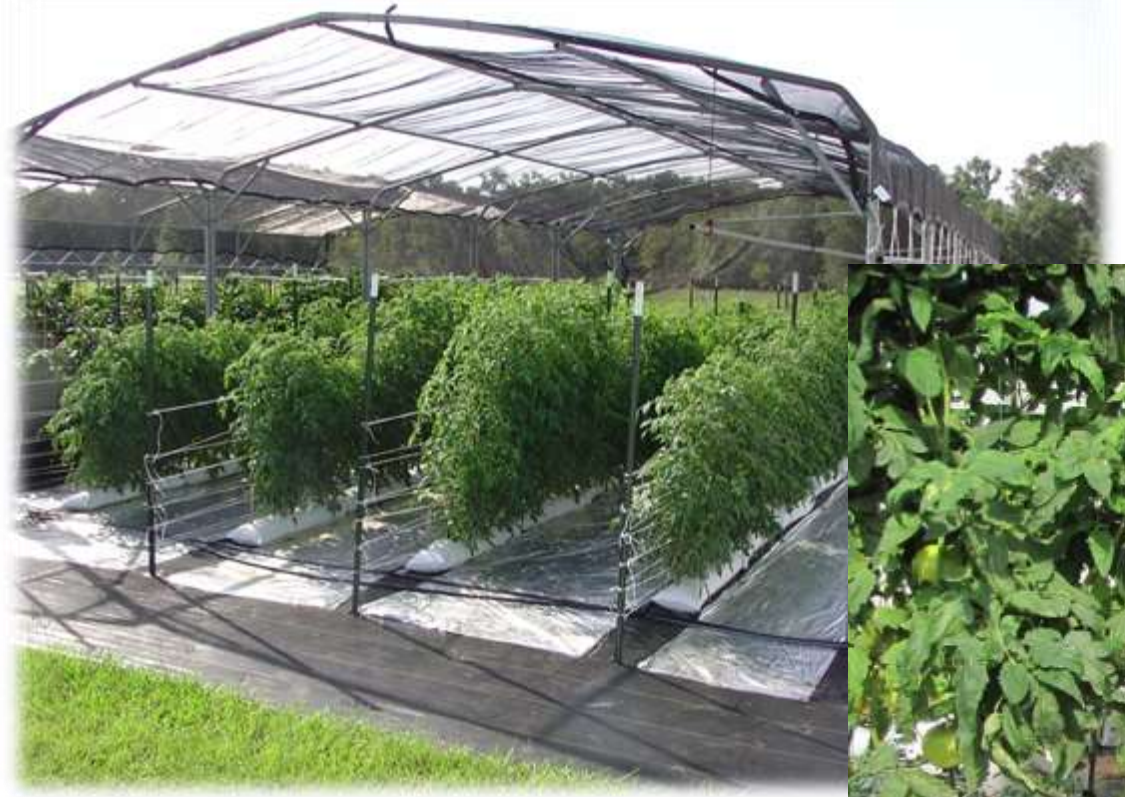


Verti-Gro Under Shade

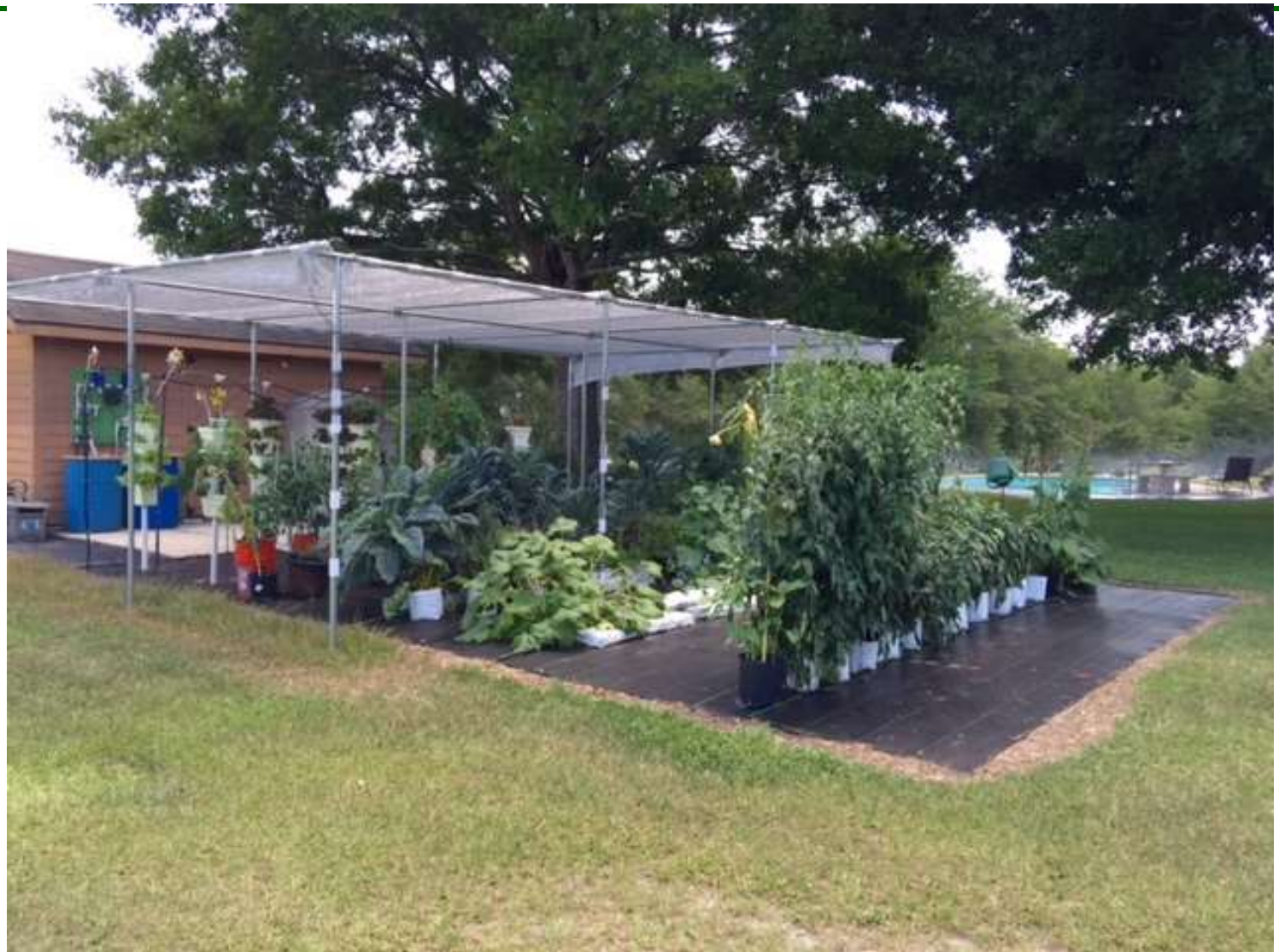
Floating Lettuce Under Shade



Heirloom Tomatoes Under Shade
Oops!!!!, Maybe Not in Mid Summer!



Florida Gardening In The Shade



Starting a Successful Hydroponic Business

Hydroponic Controlled Growing Systems for Locally Grown Products
"The Hands-on Approach to Learning"

March 12-13, 2018
March 16 - 17, 2018

UF NFREC-Suwannee Valley
8202 County Road 417, Live Oak
FL 32060

http://smallfarms.ifas.ufl.edu

Thank You

- For more information visit the Small Farms web at http://smallfarms.ifas.ufl.edu

- Take a virtual field day tour by visiting the Virtual Field Day web at http://vfd.ifas.ufl.edu