Organic Crop Production: High Tunnel Production- Year 1: Lessons Learned

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Cool Season Crops Project

- Conducted fall/winter 2008-2009
- 3 varieties of 11 crops grown in high tunnels and in low tunnels, replicated 3 times
- Growth measurements and harvest data were collected
- Experiment started 28-Oct-08, ended 13-Mar-09

Cool Season Crop Varieties

- Broccoli:
  - ‘DeCicco’
  - ‘Waltham’
  - ‘Belstar’
- Spinach:
  - ‘Butterlay’
  - ‘Bloomsdale’
  - ‘Matador’
- Kale:
  - ‘Lacinato’
  - ‘Red Russian’
  - ‘True Siberian’
- Lettuce:
  - ‘Kweik’
  - ‘Winter Density’
  - ‘Brune D’Hiver’
  - ‘Ruben’s Red Romaine’
  - ‘Drunken Woman Frizzy Headed’
  - ‘Red Oakleaf’
- Swiss chard:
  - ‘Chadwick’s Choice’
  - ‘Glattersilber’
Cool Season Crop Varieties

- **Leeks**:
  - ‘Varna’
  - ‘Longfall’
  - ‘Blaugruner’

- **Radish**:
  - ‘Round Black Spanish’
  - ‘Cherry Belle’
  - ‘Miyashige White Daikon’

- **Cauliflower**:
  - ‘Graffiti’
  - ‘Odysseus’
  - ‘Cassius’

- **Kohlrabi**:
  - ‘Dyna’
  - ‘Kolibri’
  - ‘Superschmelz’

- **Beets**:
  - ‘Moneta’
  - ‘Golden Detroit’
  - ‘Chioggia’

- **Sweet peas**:
  - ‘Mammoth Melting’
  - ‘Cascadia’
  - ‘Sugarsnap’

- **Carrots**:
  - ‘Red Core Chantenay’
  - ‘St. Valery’
  - ‘Oxheart’

- **Onions**:
  - ‘Mini Purplette’
  - ‘Evergreen’
  - ‘Parade’

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Cool Season Crops: Kale

Harvest data taken from an average of 12 plants, harvested 3 times.

Cool Season Crops: Leeks

Harvest data taken from 24 Blaugrune, 29 Varna, 24 Longfall plants. 36 transplants of each variety initially planted.
Spinach

Cool Season Crops: spinach

Soil Temperature

Results

- Soil temperatures in high tunnels were 5-10 degrees warmer than in low tunnels
- High tunnel crops out-performed those in low tunnels—no plants in low tunnels were harvested
- Crops that performed well were kale, leeks, spinach, radish and lettuces
- Crops that did not perform well were sweet peas, broccoli, cauliflower, beets, carrots, onions

Seeds were direct sown and thinned to 30 plants per row per replicate, harvested 6 times
Lessons Learned

• Harvest times are lengthened in high tunnels over winter
• Timing is key: plant late-maturing crops and transplants earlier
• Keeping high tunnels air-tight is important
• Also, cover inside with row cover on below-freezing days

Early Season Production Potential of Hybrid and Heirloom Tomatoes

High Tunnel Tomato Project Summary

• Potential for early-season tomatoes
• Conducted spring/summer 2009
• 3 heirloom, indeterminate varieties: ‘Cherokee Purple’, ‘Arkansas Traveler’, ‘Valencia’
• 3 hybrid, determinate varieties: ‘Fletcher’, ‘Primo Red’, ‘BHN 598’
• 3 planting dates: 27-March, 17-Apr, 8-May
• 3 replicates

High Tunnel Tomato Project

• Low tunnel fabric was removed from tomatoes in mid-April, leaving plants uncovered
• Tomatoes were harvested twice a week for a 7 wk period
• Yield, disease and insect occurrence, growth and development, fruit texture, color and sugars were measured
Early Blight
*Alternaria solani*

Verticillium Wilt
*Verticillium albo-atrum* and *V. dahliae*

Tomato Early Blight
Based on a 3 plant per plot sample

August 2009

Leaf Mold
*Fulvia fulva*
Tomato Harvest
Number of tomatoes in high and low tunnels at peak production (38 d after planting: July 4, 2009)

Based on cumulative harvest of 8 plants
Tomatoes were harvested twice per week, for 7 wks

Preliminary Results

- Plants in low tunnel/uncovered were more susceptible to diseases than those in high tunnels
- Uncovered ‘Cherokee Purple’ and ‘Primo Red’ were most susceptible to early blight

Preliminary Results

- ‘Fletcher’ and ‘Primo Red’ grown inside high tunnels had higher yields than low tunnel/uncovered plants during peak production on July 6
- Hybrid tomato plants had greater yields than heirloom plants both in high tunnels and low tunnel/uncovered
- ‘Arkansas Traveler’, ‘Valencia’ and ‘BHN 589’ had equal yields in high tunnels and low tunnels
Future Workshops

- September 14: Identifying and Managing Diseases
- October 12: Developing an Organic System Plan
- November 9: Marketing Organic

Organic Farming in Tennessee - Growing Opportunities

- Workshops will cover the organic certification process, organic farming & conservation, farm loans & program assistance for certification.
- August 20: UT Martin McNairy County Center/Selmer
  - Contact Debra Blankenship (debbie.blankenship@tn.usda.gov; 731.668.7770 ext. 100)
- August 27: McDonalds Farm, Sale Creek, TN (Hamilton Co.)
  - Contact Todd Trew (todd.trew@tn.usda.gov; 423.775.2272)
- September 2: HRREC, Springfield, TN (Robertson Co.)
  - Contact Phillip Wilson (philip.wilson@tn.usda.gov; 615.382.98.63)

Questions?

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