Salad Green Production for Dining Services at the UIUC Sustainable Student Farm

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What is a High Tunnel?

- Any unheated, non-permanent greenhouse structure, usually covered with polyethylene plastic or shade cloth, used to create protective microclimates.
- Also known as hoop houses or cold frames
- Much lower capital investment than conventional greenhouse:
  - Greenhouse≈\$10-\$20/ft^2
  - High tunnel≈\$1-\$4/ft^2

Winter High Tunnel Production and Cold Hardy Crops

- Success depends on combination of cold hardy crops and microclimate created by high tunnel.
- 15 plus varieties that are extremely resistant to cold temperatures
- Arugula, Spinach, Mache, Mizuna (Among other *Brassica* Asian Greens), Claytonia, Lettuce, Kale, Beet greens, and storage crops.

Microclimate

- Created by the capture of passive solar heat in soil and retention beneath layers of the high tunnel and additional inner tunnel

- High tunnel structure with one or two layers of 4-6 mil polyethylene covering is the more economical option.

Inner Tunnels

- Additional “inner” tunnels can increase the amount of protection crops receive.
- Each layer added analogous to moving 1.5 USDA hardiness zones to the south (Eliot Coleman).
- Frozen condensation on inner tunnels increases the amount of passive solar heat trapped

Inner Tunnel/Tent

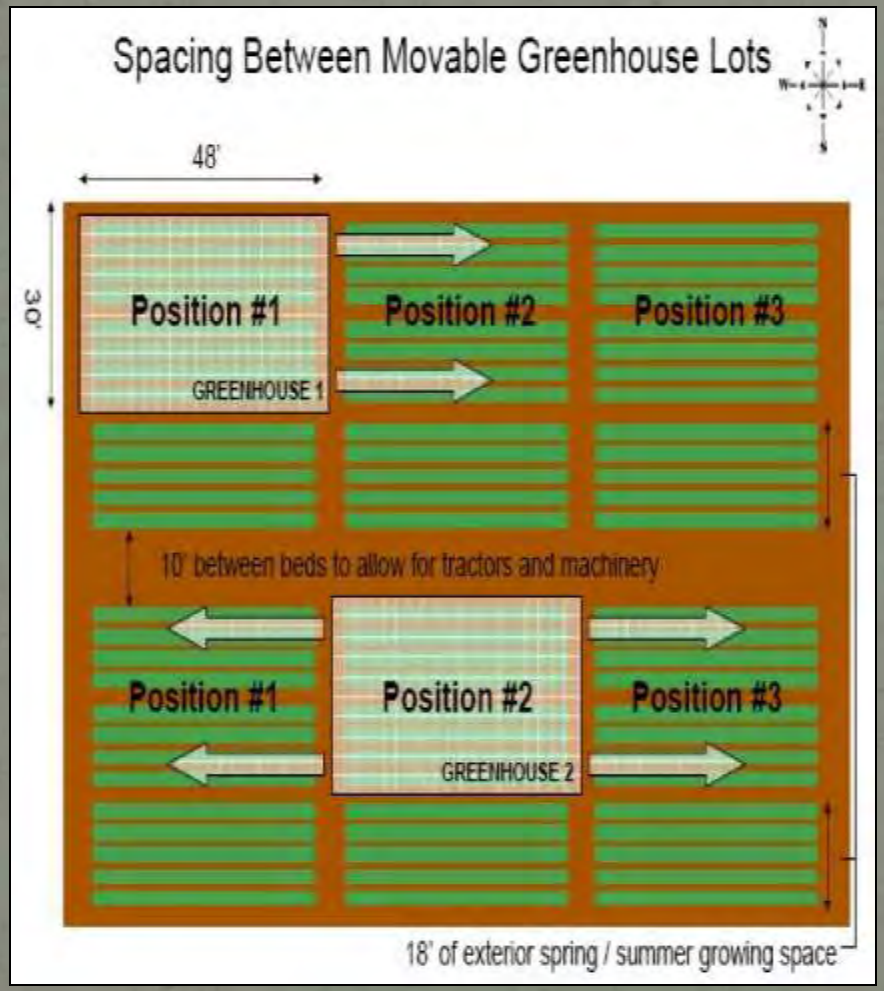
Winter Production Examples

12/6/06

12/06/06 No Inner Cover

2/8/07 -8ºF night low

Mobile Tunnel Rotation



Mobile Tunnels at SSF

Internal Bracing and Track

Quick Hoops – Low Tunnels

Quick Hoops

Pest Problems

- Not very many pressures associated with winter production.
- Crops survive and most weeds, insects, and diseases do not.
- Physical barriers from two layers prevents most insect pressure.
- Humid conditions can dominate the tunnels, might want to watch out for powdery mildew in early spring
- Meadow Voles and Field Mice

Economics of Production

- A seasonal range of prices between $3 to $10 dollars per pound can be expected for baby salad greens
- Higher Quality Early Spring and Fall/Winter
- Need to realize grosses between $5-$15/ft^2 with whatever mix of crops is produced
- That would equate to a gross of about $9,000-$27,000 per 30x96 high tunnel!

Winter Production Guidelines

- The use of cold/ freeze tolerant crops i.e. Spinach, Asian greens.
- Succession plantings early enough to allow sufficient growth before conditions become too limiting (most in Sept. and early Oct. in zone 5)
- Use of crops that allow for multiple harvests
- The use of polyethylene or fabric as inner tunnels/tents within the high tunnels or greenhouses

References

- Blomgren, Ted and Frisch, Tracy, 2007, High Tunnels: Using Low-Cost Technology to Increase Yields, Improve Quality and Extend the Season

- Bycynski, Lynn (editor), 2003, The Hoophouse Handbook: Growing Produce and Flowers in Hoophouses and High Tunnels

- Coleman, Eliot, 2009, The Winter Harvest Handbook: Year-Round Vegetable Production Using Deep-Organic Techniques and Unheated Greenhouses

Websites

- thefarm.illinois.edu
  - Our website
- hightunnels.org
- attra.ncat.org
- fourseasonfarm.com