

# Spring and Summer Hoophouses. © Pam Dawling 2017

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## How to make good use of your hoophouse when it's hot

- Change the micro-climate: Remove plastic, move hoophouse, shade, increase airflow, storage.
- Grow crops: Warm weather food crops, Cut flowers, Seed crops, Cover crops
- Cure or dry crops
- Improve the soil: Solarize; Desalinize
- ❖ Crop rotations and scheduling
- ❖ Warm weather pests including nematodes

I live and farm in zone 7, with an average last frost April 30 and average first frost October 14. Our goal is to feed our intentional community of 100 people with a wide variety of organic produce year round. We have one 30' x 96' FarmTek ClearSpan gothic arch hoophouse. We put it up in 2003, and like many growers we had the primary goal of growing more winter greens and early tomatoes and peppers. Our hoophouse is divided longitudinally into five 4' beds and a 2' bed along each edge. Our paths are a skinny 12" wide, as we wanted to maximize the growing space.

## Choosing shade cloth

- Our shade cloth is 34' x 96', about the same size as the footprint of the hoophouse, knitted polyethylene 50% shade from Gemplers, \$372 in 2004.
- Shade cloth is available
  - Woven or knitted: knitted fabric is stronger, lighter in weight, more flexible, and doesn't unravel when cut.
  - Polyethylene, PVC or polypropylene: Polypro is longer lasting, but only available woven. Avoid PVC as it will degrade the poly sheeting of the hoophouse.
  - In a range of shade factors. 40% is recommended for vegetables, 50% for flowers and 60% for cool weather vegetables in hot weather.
  - White, black or other colors

## Warm Weather Food Crops

- Suitable candidates: crops you'd like earlier, crops that grow in warmer climates, crops that grow better in drier climates, ideally, crops that are not in the same families as your main crops in other seasons.
- Examples: Tomatoes, peppers, eggplant, cucumbers, squash and zucchini, early green beans, cowpeas, soup beans, edamame, melons, baby ginger, turmeric, galangal, jicama (yam bean), peanuts.

## Seed Crops

Beans, peas, okra, over-wintered brassicas, lettuce, beets, chard

## Cover Crops

Buckwheat, soy, cowpeas, mustards (if no Harlequin bugs), smaller millets (Japanese millet)

## Curing and Drying

Use heavy shade cloth (80%), to avoid cooking the garlic or seeds, bleaching the strawflowers.

## Soil Solarization to control pests (nematodes) and diseases (fungal)

1. Ideally, grow a crop of mustard to bio-fumigate the soil. *Kodiak* (Brassica juncea): Suppresses soilborne fungal pathogens and nematodes, produces more biomass than other varieties; *Pacific Gold* (Brassica juncea): Reduces soilborne fungal pathogens, nematodes; *IdaGold* (Sinapis alba): Suppresses weeds.
2. Cut down the mustard at flowering (chop into small pieces) and dig it in.

3. Rake the soil to give a good tilth
4. Restore the drip tape
5. Cut a piece of old hoophouse plastic to cover the bed with a foot or more spare all round.
6. Using a square-ended spade, step along the line marking the edge of the bed, pushing the plastic down into the soil
7. Leave the plastic in place for at least one month in the summer.

### **De-salinization**

- Symptoms like drought-stress interfere with seed germination and inhibit plant growth. Excess salts can also encourage some pests.
- If salinity has become a problem, you could
  - Do all your winter watering with a hose
  - or cultivate the soil and flush out the salts by flooding, using sprinklers.
  - or remove the plastic for a while and let rainfall solve the problem
- After that, avoid repeating the problem by improving soil drainage and switching to vegetable-based composts and more cover crops.

### **Crop Rotations and Scheduling of Summer Crops**

- Remember to keep your fall planting dates and crop rotations in mind, especially if the winter greens and salads are the main purpose of the hoophouse.
- Essentially we have 3 crop seasons in our hoophouse: winter crops planted in the fall, early warm weather crops planted in March and April, and high summer crops planted in July.
- The bulk of our winter crops are planted from mid- September to mid-October.

### **Sowing when soils are hot**

1. If soil temperatures are too high for good germination, cool a small area:
  - Use shade from other plants, shade cloth, boards, burlap bags,
  - For crops you normally direct seed, consider cooling a small nursery bed for your seedlings and transplanting later.
2. If your hoophouse is impossible, start seeds indoors:
  - Put a plastic flat of lettuce in your refrigerator or a cool room.
  - Use plug flats or soil blocks rather than open flats, to reduce transplant shock.

### **Root Knot Nematodes**

- We have grown nematode-suppressing cover crops, French marigolds, sesame, wheat.
- We have solarized from June to September
- Our current approach is to have two years of resistant crops, followed by one year of somewhat-susceptible crops
- Resistant crops: Kale, Yukina Savoy and radishes in winter, West Indian gherkins, Mississippi Silver Cowpeas in summer.
- 64°F is the threshold soil temperature for nematode reproduction

### **Supplies**

- Klerk's Kool Lite Plus plastic. <http://www.gpnmag.com/greenhouse-structures-article2267>
- Robert Marvel Plastics for Solaroof: [www.robertmarvel.com](http://www.robertmarvel.com)
- Shade Cloth and grommets: [www.gemplers.com](http://www.gemplers.com), [www.pakunlimited.com](http://www.pakunlimited.com) or <http://www.green-tek.com/>

Plan for summer. 7 longitudinal beds, A-G. Beds A and G are the 2'/60cm wide edge beds – see next page.

Bed	Date	Task	Date	Task	Date	Task
A 2'	2/1	Sow snap peas at back	7/12	Pull snap peas, sow cowpeas	10/15-10/25	Pull cowpeas, spread compost, rake in. Transplant senposai. Sow radishes, scallions
B 4'	4/1	Transplant cucumbers with compost in holes	7/12	Pull cucumbers, sow drying beans	10/23	Pull beans, spread compost, rake in. Transplant kale, chard, mizuna, arugula, yukina savoy. Sow tatsoi, chard
C 4'	3/15	Transplant tomatoes with compost in holes	7/30	Pull tomatoes, sow buckwheat & soy cover crop	9/8	Pull cover crop (use to mulch peppers); spread compost, rake in. Sow spinach, radish, scallions, bulls blood beets, tatsoi
D 4'	3/15	Transplant tomatoes with compost in holes	7/30	Pull tomatoes, sow buckwheat & soy cover crop	10/1-10/10	Pull cover crop (use to mulch peppers); spread compost, rake in. Transplant Tokyo bekana, maruba santoh, Chinese cabbage, pak choy, yukina savoy. Sow turnips
E 4'	4/1	Transplant peppers with compost in holes			10/15-10/24	Pull peppers, spread compost, rake in. Transplant lettuce, celery. Sow mizuna, arugula, lettuce mix
F 4'	4/1	Transplant summer squash with compost in holes	7/22	Pull squash, sow edamame	10/1	Pull remaining edamame for seed. Spread compost, rake in. Transplant lettuce, chard
G 2' west	4/1	Transplant ½ bed hot peppers with compost in holes			10/23	Pull peppers, spread compost, rake in. Sow spinach
G 2' east	3/2	Sow ½ bed bush beans	6/2	Pull beans, sow edamame	11/5	Pull edamame, spread compost, rake in. Sow onions

## Resources

ATTRA [attra.ncat.org](http://attra.ncat.org):

- Market Farming: A Start-up Guide*,
- Scheduling Vegetable Plantings for a Continuous Harvest*,
- Season Extension Techniques for Market Farmers*.
- Cole Crops and Other Brassicas: Organic Production*

**SARE** [www.sare.org](http://www.sare.org) A searchable database of research findings:

- Season Extension Topic Room*

[extension.org/organic\\_production](http://extension.org/organic_production) The organic agriculture community with eXtension. Publications, webinars, videos, trainings and support. An expanding, accessible source of reliable information.

**Growing Small Farms:** [growingsmallfarms.ces.ncsu.edu/](http://growingsmallfarms.ces.ncsu.edu/) Debbie Roos keeps this site up to the minute. Click Farmer Resources

**Penn State Extension High Tunnels site:** [extension.psu.edu/plants/plasticulture/technologies/high-tunnels](http://extension.psu.edu/plants/plasticulture/technologies/high-tunnels)

The **HighTunnels** website has information on construction, warm weather crops and much else: <http://hightunnels.org/for-growers/>

**Kerr Center for Sustainable Agriculture** Hoop House How-To. Low cost DIY small hoophouse. <http://kerrcenter.com/organic-farm/hoop-house/>

**High Tunnels: Using Low Cost Technology to Increase Yields, Improve Quality, and Extend the Growing Season** by Ted Blomgren, Tracy Frisch and Steve Moore. Published by the University of Vermont Center for Sustainable Agriculture, with funding from SARE. \$15 or on the web: <http://www.uvm.edu/sustainableagriculture/hightunnels.html>

**The Association of Specialty Cut Flower Growers** <http://ascfg.org/>

**Soil Solarization** Homepage: <http://agri3.huji.ac.il/~katan>

- ❑ **Soil Solarization University of California:** <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74145.html>
- ❑ **Southern Exposure Seed Exchange,** [www.southernexposure.com](http://www.southernexposure.com) wonderful link for Seed Saving Resources: <http://homepage.tinet.ie/~merlyn/seedsaving.html>
- ❑ **Saving Our Seeds** website has information on isolation distances, seed processing techniques, where to get manuals on growing specific seeds, and links to more information: [www.savingourseeds.org](http://www.savingourseeds.org)
- ❑ **Garden Medicinals and Culinaries** sells manuals on seed growing and processing: <https://www.gardenmedicinals.com/>

### Slide shows:

Many of my presentations are available at [www.Slideshare.net](http://www.Slideshare.net). Search for **Pam Dawling**.

- ❑ *Fall and Winter Hoophouses*
- ❑ *Cold-hardy Winter Vegetables*
- ❑ *Producing Asian Greens*
- ❑ *Production of Late Fall, Winter and Early Spring Vegetable Crops*
- ❑ *Succession Planting for Continuous Vegetable Harvests*

**Other slide shows** I recommend:

- ❑ **Alison and Paul Wiediger** : [www.slideshare.net/aunaturelfarm/high-tunnel-1-why-grow-in-high-tunnels](http://www.slideshare.net/aunaturelfarm/high-tunnel-1-why-grow-in-high-tunnels) and at least 11 more.
- ❑ **Mark Cain** *Planning for Your CSA:* [www.Slideshare.net](http://www.Slideshare.net) (search for Crop Planning)
- ❑ **Tom Peterson** *Farm Planning for a Full Market Season* [vabf.files.wordpress.com/2013/02/tom-peterson-farm-planning-for-a-full-market-season.pdf](http://vabf.files.wordpress.com/2013/02/tom-peterson-farm-planning-for-a-full-market-season.pdf)
- ❑ **Brad Burgefurd**, *Cultural Practices And Cultivar Selections for Commercial Vegetable Growers.* [www.slideshare.net/guest6e1a8d60/vegetable-cultural-practices-and-variety-selection](http://www.slideshare.net/guest6e1a8d60/vegetable-cultural-practices-and-variety-selection)

### Books

- ❑ ***Walking to Spring, Using High Tunnels to grow produce 52 weeks a year,*** Alison and Paul Wiediger <http://aunaturelfarm.homestead.com/bookorderform.html>
- ❑ ***Knott's Handbook for Vegetable Growers,*** Maynard and Hochmuth
- ❑ ***The New Seed Starter's Handbook,*** Nancy Bubel, Rodale Books
- ❑ ***The New Organic Grower,*** Eliot Coleman, Chelsea Green
- ❑ ***The Flower Farmer*** by Lynn Byczynski from [www.GrowingforMarket.com](http://www.GrowingforMarket.com)
- ❑ ***The Hoopouse Handbook*** from [www.GrowingforMarket.com](http://www.GrowingforMarket.com)

### Articles

- ❑ *Growing For Market* May 2005 has an article by Steve Moore on summer hoopouse use in PA.
- ❑ *Growing For Market* June 2008 has an article I wrote "The Hoopouse in Summer"
- ❑ *Growing For Market* February and March 2009 Seed Growing articles
- ❑ **Resources for Ginger and Turmeric**
- ❑ Alison and Paul Wiediger <http://aunaturelfarm.homestead.com/High-Tunnel-Ginger.html>
- ❑ Reza Rafie and Chris Mullins at Virginia State University [https://www.youtube.com/watch?v=auayx8l\\_M04](https://www.youtube.com/watch?v=auayx8l_M04) <http://www.vsuag.net/wp-content/uploads/2014/10/Ginger-Day-Presentation-2014.pdf>
- ❑ College Of Tropical Agriculture and Human Resources, University of Hawai'i at Manoa <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/scm-8.pdf>
- ❑ Puna Organics and Biker Dude to buy seed ginger in November <http://www.hawaiianorganicginger.com/how-to-order>. Turmeric and galangal also available
- ❑ *Growing For Market* August 2008 and November 2011 Ginger
- ❑ Ginger SARE Reports by Melissa Bahret, Greenhouse Ginger Cultivation in the Northeast: <http://mysare.sare.org/mySARE/ProjectReport.aspx?do=viewProj&pn=FNE06-564> and <http://mysare.sare.org/mySARE/ProjectReport.aspx?do=viewProj&pn=FNE07-596> [oldfriendsfarm@vegmail.com](mailto:oldfriendsfarm@vegmail.com)