



# Season Extension

**H**oophouses are sprouting up all over the Upper Midwest. As more markets for local foods open up, more farmers are building hoophouses to “extend” their season beyond what they could produce without this extra protection.

The words “hoophouse” and “high tunnel” are often used interchangeably. Basically, these structures are unheated greenhouses, usually covering intensively managed crops. Hoophouses can help producers extend their growing season and improve the quality and value of their produce.

## Key things to consider

**Site selection:** Choose a site based on soil type, soil fertility, full sun, good drainage, and low weed pressure. The more time you take to consider your hoop site the less time you’ll spend fixing problems later. Level ground is a very important factor in building a hoophouse. You want your ground to be as level as possible, with no more than a 3% slope. Most likely, you already have a field where you are growing produce. Don’t rule out that area for your hoophouse. If you already have a successful field, you can cover it and extend the use of that field with a high tunnel.

**Orientation:** The standard orientation is to have the center purlin run east/west. This way you get the best light in the winter when the sun is low, and the long side of the high tunnel will face south to collect as much heat as possible. However, your prevailing wind direction may affect this decision. Be careful not to skimp on the strength of your greenhouse structure, especially if wind or snow is an issue in your region.

**What to grow:** Most likely you will be growing a variety of vegetables or small fruit crops to take to a farmer’s market, put in a farm stand, or for your CSA shares. Perhaps you want to grow just berries and tomatoes—think this through since each needs a different type of environment throughout the year. You

might want to consider a crop that requires you to remove the plastic for the winter and then put it back on in the spring. If you are planning tomatoes or cucumbers, be sure the high tunnel is constructed strongly enough so that you can tie your plant trellises to the greenhouse, or you will need to build trellises that are free standing.



Organic regulations stipulate that you can’t grow the same annual crops year after year in the same “field.” This regulation is in place for a good reason. The hoophouse is just like any other field on your farm. Soil fertility and management are the foundations for healthy crop yields, as well as control of pests, disease, and weeds. Crop rotation is critical to soil management. Plan rotations within the hoophouse to meet both your market needs and to promote healthy soil and nutrient cycling.

**Soil fertility:** You can maintain soil fertility from year to year by adding compost to beds along with organic fertilizers and micronutrients. If you are growing many succession crops, you will need to keep amending and fertilizing your soil throughout the year. Adding at least 2 inches of compost to your beds in the fall or spring will add organic matter to your soil. During

the growing season, you can till in the crop that is finished and add more compost. Adding to the organic matter will go a long way toward preventing problems with salt build-up from watering, and helps avoid diseases that can be a problem in a hoophouse environment. Consider adding short-season cover crops such as chickling vetch, oats or buckwheat to your rotation to add fertility and help with weeds.



**Watering systems:** No matter what you crops you choose to grow, they are going to need water—so spend some time initially thinking through how you'll supply water to your plants. Will you use drip tape, a hose and wand, ground or suspended sprinklers? The most common hoophouse watering method is drip tape. This is the most efficient way to get water to your plants. Generally with drip irrigation one main hose runs the width of the hoophouse, with lines of drip tape lining the rows of each bed. If you are only growing from late spring to late fall, you can probably get by using a hose as your water source. But if you plan to water through the cold, snowy days of winter, you'll need a different water source. A large tank with a stock tank heater that serves your drip tape system might be one solution. You will need to fill the tank using a hose still, but not as often during the winter. Unless there are a lot of sunny days, you will probably only need to water once every 10 to 20 days or so in winter. Overwatering can be a problem, since cold, wet soil and plant leaves are susceptible to fungal problems.

**Extra plant protection:** Internal secondary hoops made from wire or light weight PVC pipe covered with plastic or floating row cover can be used to give your plants extra protection on cold nights. There is no wind inside the high tunnel during the winter months, so the covering will not need weights to hold it in place. If you are growing cold-hardy crops such as spinach, and your winter is not too severe, you might be able to harvest greens every week from October to May.

## **Additional Resources**

The comprehensive Midwest Season Extension website, [www.midwestseasonextension.org](http://www.midwestseasonextension.org), offers resources from irrigation equipment to structure supplies, books, links, an event calendar, and news about the latest research in the area of season extension. The website is a joint project of MOSES, the Minnesota Institute for Sustainable Ag (MISA), and the Institute for Agriculture and Trade Policy (IATP).

### **Other Websites:**

[www.hightunnels.org](http://www.hightunnels.org)

[aunaturelfarm.homestead.com](http://aunaturelfarm.homestead.com)

Penn State Center for Plasticulture  
[plasticulture.psu.edu](http://plasticulture.psu.edu)

U of MN High Tunnel Production  
[hightunnels.cfans.umn.edu](http://hightunnels.cfans.umn.edu)

### **Blogs:**

The Hoophouse Blog, by Adam Montri  
<http://hoophouse.msu.edu/blog/index.php>

### **Books:**

1. The Hoophouse Handbook, by Lynn Byczinski
2. The Winter Harvest Manual, by Eliot Coleman
3. Walking to Spring, by Paul & Alison Weidiger
4. The Northlands Winter Greenhouse Manual, by Carol Ford & Chuck Waibel

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**[www.mosesorganic.org](http://www.mosesorganic.org)**