

## Q & A: Garden Devices



**Q.** Thanks for the Hartley Greenhouse website. These are really beautiful, but I won't show these to my wife. I need to get a real good book or two on building a greenhouse. Any suggestions?

Here are some starting points.

1. Check out the DIY section at Lowes. Tania got the Ortho Books "Greenhouses: Planning, Installing and Using Greenhouses." Herein you will find lots of ideas and the two main options: build it yourself from scratch and build from a kit.

2. Tania helped her father build a greenhouse kit made by Sunglo. It was 10' x 15' and cost \$5k without the foundation. There is actually quite a lot of work involved, even with a kit (digging and installing the foundation). Of course, these are expensive.

<http://www.sunglogreenhouses.com/>

3. Commercial growers use something completely different, with tubular frames. One inexpensive source is Farm-Tek, from which I get occasional supplies. They also have smaller kits for backyard growers <http://www.farmtek.com/farm/supplies/home>

4. The tubular frame approach is what I used, scaled down to the DIY approach.

<http://www.builditsolar.com/> is a great DIY solar site. On the projects page, you will find an entire section on greenhouses and solar spaces

(<http://www.builditsolar.com/Projects/Sunspace/sunspaces.htm>) which should set your heart a-flutter. On the same projects page you will also find a whole section on solar homes, which may provide a few ideas for your new house.

5. For us, there are two big issues: wind resistance and internal moisture control. Since you are in such a dry climate, the second issue may not amount to much. However, with your wind regimes, you should make sure it can take wind loads (and snow loads -- you will definitely want a hip roof if free standing so snow will come off easily, and a shed roof of appropriate slope if attached to your house).

6. On foundation, make sure you install 2" of foamboard around the external foundation below grade, probably down to 2' to keep out the cold transmitted through the ground.

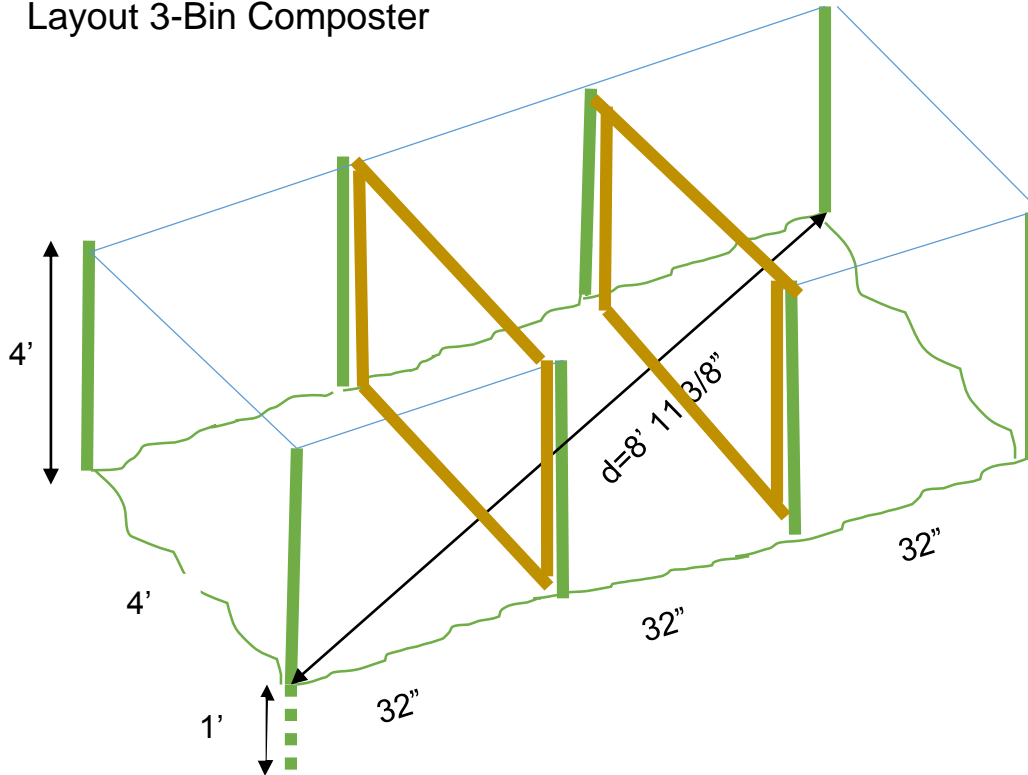
7. Play around with free-standing and attached versions. The latter will benefit from the protection of the house, and be warmer in the winter. Perhaps even too warm. As you drive around your area, keep a lookout for folks who have greenhouses, and talk to them about their experiences, designs, materials, and in particular, problems encountered and what they would do differently next time.
8. Remember to orient your greenhouse east-west, so that the long side faces south.
9. Greenhouses have to be installed on level ground. For you, that will mean building up the south side or digging into the earth to bury part of the north side (probably preferred). The problem with building up the south side is that the wall will shade part of the interior behind the wall -- and you lose that internal growing area. Of course, you could compensate by raising the interior soil level to the top of the south wall foundation.
10. Whereas commercial growers can get away with quonset hut or round shapes, a gothic design (vertical walls, sloping roof planes) works better for small greenhouses -- you can walk next to the side, and snow sheds easier. Farm-Tek makes two nice ones reasonably priced: 11' x 16' for \$4k (type in 104564 in the catalog item blank, upper left, [www.farmtek.com](http://www.farmtek.com) 11' x 24 for \$5k (code 103967)
11. I searched under "greenhouses, colorado," and came across two sites of interest: <http://www.myhobbygreenhouse.com/> and <http://www.coloradonga.org/> where they have a link "For the Home Gardener."

### **3-bin compost design**

**Q.** I see you are going to do a composting workshop at Millbrook Marsh this spring. Garden Starters has gotten permission to add two beds to our demonstration garden and one of them is planned as a three bin composing bed. We have a 4 x 8 foot bed for the compost bins. Any suggestions on how to design them would be appreciated. Bill

Bill, here is our proposed design, with a set of materials and tools required.

## Layout 3-Bin Composter



Materials	Tools
<ul style="list-style-type: none"> <li>• Eight 5' green metal garden stakes</li> <li>• Welded wire fencing, galvanized or plastic coated. 2"x4" grid is standard for galvanized, and some-what smaller for plastic coated. A good height is 4', which should take you to the top of the 5' stake once pounded in. Length 16+ to 22' as described below in Guidelines step 4 to which you must add 8' for the dividers, described in step 6 below. Thus, total length of fencing will be 24+ to 30'.</li> <li>• 14 or so gauge wire plus wire cutters to tie fencing to stakes near ground if necessary (I have lots of this)</li> <li>• Wooden frames made from 1 x 4s to which pieces of the fencing are secured with brads. You will require ~ 32' of boards to make dividers (i.e., four 8' boards). You will require ~ 8' of fencing in two 4' x 4' pieces.</li> <li>• Four brick pieces or stones to hold bottom of frames off wet soil to reduce premature rotting of wooden frame.</li> </ul>	<ul style="list-style-type: none"> <li>• Sledge hammer</li> <li>• Level</li> <li>• Tape measure (at least 12' long)</li> <li>• Carpenter's square</li> <li>• Old screwdriver and pliers to pry open stake tabs if necessary so you can hang fencing</li> <li>• Hammer, nails or screws to make frames, and brads to hold fencing onto frames</li> <li>• Saw if you are going to saw on-site</li> <li>• Rasp/file to knock off burrs</li> <li>• Pencil or scribe</li> <li>• Drill plus bits for pilot holes</li> <li>• Screwdriver or driver for screws.</li> <li>• Cutting pliers to cut wire</li> <li>• Ordinary pliers to twist wire holding dividers to garden stakes.</li> </ul>

To the reader: Bill and friends ended up building their 3-bin composter! Here is an image of the results:





I also came across James Howard Kunstler's website wherein he showed his for a 3-bin composter. As far as I can tell, it does not have removable dividers; consequently, you have to shovel your compost over the top, or out and around the dividers. It also requires a lot more carpentry. Scroll down a bit on the following link:

<http://kunstler.com/my-garden/the-garden-second-year-2013/>

### **Jeavons Mini-Greenhouse**

**Q.** Now that I've finished our mini-greenhouse, I'm wondering what you have learned regarding its optimal operation? Cody

The Achilles heel of all greenhouse operations is adequate ventilation, required to control heat and moisture levels. Stagnant air, especially over the space of a rainy spell when the greenhouse is closed, can lead to damping off of emerging seedlings, and buildup of molds and fungi on the soil of your flats and seedlings.

We do two things to control heat and moisture beyond opening and closing the doors.

1. Door props. I have cut four blocks out of scrap 2 x 4's approximately 4 1/2" long. We use these to prop up one or more of the doors, placing the blocks midway across the length of the door between the door and the side panel. This works well on cooler days or rainy days when you want some protection but also some ventilation. The blocks give you three heights for

opening the doors: 1 3/4", 3 1/2" and 4 1/2".

2. Fan. We use a small fan to circulate air inside the greenhouse during the night, and daytimes when the greenhouse is closed (e.g., against rain or cold). This reduces substantially the incidence of damping off, and molds and fungi building up on your seedlings and soil.