



## How to build a greenhouse on a budget

By **Bill Keene**

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**T**he basic principle of a greenhouse is to trap the heat of the sun and create a warm, nurturing and protected environment for the plants inside. With a suitable selection of plants and an appropriate choice of the structure you want, you can design, build and maintain your own greenhouse with just a little ingenuity, effort, understanding and knowledge.

The most important thing to do when you plan to build a greenhouse on a budget is to ask yourself whether you really, really want one! Once this is settled, you know you are committed and you can start thinking about tips to construct your greenhouse without it costing you a fortune. There are several options here. One is that you earmark the amount you can spare to get things up and running, and second is that you be prepared to find time and to make the physical and mental effort to do yourself whatever you can in order to cut costs.

The first step now is to arm yourself with useful and practical information. You can turn to the internet which would be your best resource for a wealth of tips on your project. You could browse gardening or greenhouse magazines, talk to gardeners or growers in local nurseries or gardening stores, and finally look for alternative equipment at hardware stores in your neighborhood. You will find usable material and practical information in each of these places – collate it, sort it, think about its applicability, and finally use it. In any case, building on a budget requires you to first look for options to cut costs in choosing and procuring construction materials and equipment, and then to be innovative, creative and unconventional in your approach.

### **Looking for options to cut costs:**

1. On a budget, an easy option is to get a building kit and erect your greenhouse, get a hobby greenhouse or a portable structure. This is possible if you are looking at a particularly small structure, maybe to just start seeds or root cuttings for early sowing in spring. Depending on your funds, you could opt for a dome type portable greenhouse which can house a few dozen plants.
2. If you decide to procure and build yourself, scout for used lumber in your neighborhood. Used lumber or secondhand lumber is extremely economically viable as it reduces your frame costs to practically nothing. Wood of good quality is durable, easy to work with and is an insulator so it will cut loss of heat during winters. Look for quality lumber at best bargains.
3. You could go in for a lean-to type greenhouse rather than a free-standing one. The lean-to would mean you already have one wall that is standing and ready to provide the support for the construction of the rest of the structure. Additionally, you will be able to use the water



supply and electric points from your home to keep your greenhouse in working order, rather than building independent supply points to meet both requirements. Build the other three sides of your greenhouse yourself and you have a great greenhouse that is really economical to set up.

4. You can save funds by finding a spot in your yard that is more or less level. Finding a spot that gets the maximum sunlight would help you in winters by keeping your heating costs down.
5. Though glass is not an inexpensive option, if you plan to build your greenhouse using it as glazing, be sure that you use wood for framing rather than PVC as PVC would not have the strength to hold up glass securely. Go for double layering of glass panels if possible in case you are in an area that experiences severe winter. The double layering traps air in between and acts as an insulating layer.
6. For framing materials, PVC is easily available, inexpensive and is not difficult to work with. A portable hoop house would help overwinter your plants, especially those that can handle cold, but not frequent winter snaps or winter rains. An unheated hoop house can raise daytime temperatures by up to 10 degrees, keep out rain, and offer protection against wind, frost and heavy dew. This translates into extension of your summer gardening by about a month and allows you to have a wider variety of plants through winter.  
To build the framework with PVC, you would need to get several lengths of varying thicknesses. You would need heavy duty pipes of about  $\frac{1}{2}$  inch thickness to act as stakes which you will drive into the ground at a regular distance of 3 feet along the outline you have marked for the greenhouse. It helps if you have sliced the edges that go into the ground at an angle so that it is easier to push them into the ground.  
You need enough length of light duty  $\frac{3}{4}$  inch PVC pipe to fit over the stakes as ribs and arched to create the hoop shape. The same pipe is used at the ridgeline to hold all the ribs together. Three-way tee connectors and four-way cross connectors made of  $\frac{3}{4}$  inch PVC pipe are suitably used to hold ribs, ridgeline and frame in place. You can use standard black binder clips used in offices secure the plastic sheet over the frame. A less expensive option is to get a few inch lengths of one-inch black poly pipe that you slit lengthwise and use as binder clips to hold the plastic film in place over the framework.  
Once you have secured the film on all sides, you can use a bit of ingenuity and fashion a flap for a door with the provision of closing it off with weights to hold it down securely.  
Your hoop house is actually quite a light structure and holding down the plastic film at the sides near the ground with help of 2 X 4 lumber should be good enough to prevent it from lifting off in case a nasty wind works up! You would need to provide additional anchoring with ground anchors or rebars.
7. Plastic films as glazings are quite convenient to put up, but if your heart is set on the aesthetic look of glass, it is possible to find discarded tempered glass sliding doors at recycle shops. If



you are lucky, you can sometimes find new building material at such stores that is donated by companies to be sold at discounts.

Polyethylene is commonly used to cover greenhouses. However, if you are building a temporary structure such as the hoop house, you can just as well use ordinary clear plastic sheets available at the local hardware store. Poly films designed for greenhouses have a specific thickness and are generally UV stabilized to increase their life. Using ordinary plastic would serve the purpose just as well as long as it allows enough sunlight to be transmitted and creates a protective sheath around your plants. Also, for a hoop house which you may be likely to move around with seasons, the glazing material would invariably suffer wear and tear. The plastic sheeting tends to interact with the PVC framework in such a way that it damages the film. So, investing in plastic film designed especially for the greenhouse may be quite a waste as the covering is unlikely to last for any substantial duration. You cut costs by using the regular plastic film for your hoop house.

It is important to ventilate your hoop house on hot days to prevent heat stress to your plants. Simply leave the flap open to allow exchange of air. If you are using your hoop house in peak summer, you might need to use shade net over it during the day to reduce light intensity so that the internal temperature does not rise beyond the tolerance levels of your plants.

Hoop houses are efficient at trapping heat and are generally left unheated. They are good for over wintering plants and providing protection and suitable environment to plants that can withstand reasonably cool temperatures. So, if you are thinking of growing exotic or heat loving plants in off-season, the hoop house is not going to be of any use to you.

8. Once you are done with the frame and glazing, look for viable options for benches and shelving. Benches and shelves would invariably get wet, so look for materials that can tolerate exposure to water. Treated wood or tiered plastic racks work well.
9. Ventilation and circulation are essential to plant health in your greenhouse. There is the option of automated thermostat controlled ventilation system that kicks in when the temperature reaches a particular level. A fan on the roof blows vents open and stale air is replaced by fresh air from vents for inflow. If you are into cost cutting, you can open and close vents manually instead of installing an automated system.
10. For heating your greenhouse you can use electricity, thermal mass that stores heat and radiates it back into the greenhouse environment when internal temperature falls, or propane or paraffin heaters. Insulation of bubble wrap is an inexpensive option to retain heat in the greenhouse.

Finally, if you want to have a portable or hobby greenhouse on a tight budget, look up the newspapers regularly for any greenhouse owners who are ready to get rid of their portable greenhouses for whatever reasons! You can get the greenhouse at great bargains and save yourself a lot of effort!

