



Hoophouses

Hoophouses (also called low tunnels and high tunnels, depending on the size) are low tech, greenhouse-like structures that can be used for starting seedlings and growing vegetables or perennial crops. They can significantly extend the spring and fall growing seasons by increasing air and soil temperatures for improved plant growth. They are easily constructed and can last many years. The dimensions can be adjusted to fit personal needs and available space.

A low tunnel may be 4 ft x 10 ft and a larger design (high tunnel) could be 14 to 40 ft x 100 ft or more. Small hoophouses are ideal for small garden beds while larger designs can be built over existing fields.

The most common, inexpensive designs use PVC pipe to support the plastic cover and two end walls that provide access and stability. In Arizona, it is also important to design the hoophouse so the sides can be rolled up to provide ventilation during warmer weather.

Take care when selecting the hoophouse site as they are not easily moved. The site should be level and have well-drained soils that are free of rock/gravel, known plant pathogens, and perennial weeds. The site should not be shaded, particularly on the south and west sides. The site also needs to be located near a year-round water source. Tools needed include: circular saw, electric drill and bits, sledgehammer, square, tin snips, socket wrenches, and a few other common hand tools. For the smaller designs, end walls and doors can be constructed by one person, extra help will be needed to cover the tunnel with plastic and to fasten the plastic to the end walls.

It is best to begin by building the two ends which are identical and made from lumber. Redwood or treated lumber can be used where the wood will be in contact with the soil. The 1" schedule 40 PVC pipe will create the hoops which should be coated with white exterior latex paint to prevent photodegradation of the plastic. Make sure you glue the PVC before you paint. Various high tunnel designs have differing heights depending on crops to be grown. The tall designs have straight side walls which allow the grower more freedom of movement when working inside.

Once the ends are built, the area can be staked off and the ends placed and secured to the ground. It is important that the corners be square – this can be checked by measuring from corner to opposite corner crosswise. The PVC hoops are secured to the ground by pounding 24-inch lengths of ½ inch rebar 18 inches into the ground. Gently slide the lengths of PVC over the 6 inches of rebar that remains above ground to hold each hoop in place.

The plastic sheeting should be UV resistant and at least 6 mil thick. Have some friends handy to attach the plastic sheeting to one end wall and over the hoops then to the other end wall. Wiggle wire and track are specialty products available from greenhouse supply companies which can be used to attach plastic sheeting. Nylon twine is tied to the rebar stakes and run on the outside of the high tunnel for added stability and to keep the plastic taut. The twine should be just loose enough to allow slipping the polyethylene plastic up when raising the sides of the high tunnel for ventilation.

Consider including electrical power for lighting and/or power tools. Shade cloth can be added in summer to decrease solar radiation and subsequent heat. Some growers remove the plastic sheeting during warm weather to allow greater flexibility. Floating row cover can be used inside the hoophouse where there are extreme cold conditions. Hoophouses are less expensive and more practical/adaptable than prefabricated greenhouses – especially for backyard food production. Many home greenhouses cannot be adequately cooled in summer and go underutilized.

Many details have not been included in the above description. Here is an additional resource:

Constructing a Low-cost High Tunnel, Utah State University Cooperative Extension

https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1297&context=extension_curall



High tunnel with end-walls (photo by University of Arizona).



Small self-venting garden tunnel. This is a great design for backyard enthusiasts and is described in detail at the Utah State University Extension link below (Photo by Utah State)

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