

How to Build a Hoop House

Extend Your Growing Season

For years farmers have been limited by their regions' typical growing season and atypical weather events that may occur throughout a growing season. Constructing a hoop house is one way farmers can minimize these natural limitations.



Hoop houses are semi-curved frames covered with a layer of clear plastic or nylon shade cloth. These clear plastics allow for solar heating during the early spring and late fall, thus eliminating the need for electricity. Shade cloth can be placed over the clear plastic during the summer months to protect the crops from intense heat and sunlight. The hoop house can be tailored to fit any specific needs.

Hoop houses are economical to build and usually pay for themselves during just one season. Crops can be planted in the ground, placed in raised beds or arranged on racks for seedling trays. Hoop houses permit farmers an opportunity to receive a premium for a product that they can bring to market early in the season or late in the fall. During the summer months, hoop houses become a haven for plants, to keep them safe from pests, extreme heat and damage from severe storms. For these reasons, and many more, hoop houses are gaining extensive popularity throughout the United States.

Overview

The 18-by-40-foot hoop house utilizes PVC pipes formed into hoops and is covered with a single layer of 6 mil polymer plastic for the top and 4 mil polymer plastic for the ends. During the summer months, the plas-



tic may be removed from the ends, the side curtains rolled up and a 24-by-42-inch shade cover placed over the structure. Five-foot tall "T" fence posts are driven into the ground and act as anchors for the hoops. The 1½ in. PVC pipe fits snugly over the posts, which extend about two feet up inside the hoop. A 2-by-6-inch baseboard is fastened to the PVC hoops with outdoor screws. Small poultry netting is used to keep out wildlife when the side curtains are rolled up, and a 1-by-4-inch "hip board" adds stability to the structure.

Building Instructions

Select a site that is fairly level and free of obstruction or shade. Mark the four corners of an 18-by-40-foot rectangle. Drive "T" posts at each end of the 40-foot side and then one every four feet. Each post should extend two feet above the ground. Next, glue the pieces of 1½ in. PVC pipe to make 11 thirty-foot lengths for the hoops. Always use PVC with the "bell" end for splicing. Next, make three 40-foot lengths of 1-inch PVC by gluing two 20-foot pieces together to make the purlins (horizontal beams along the length of a roof that rests on a main rafter supporting other rafters or boards). Also, make two more of these to use as roll-ups for the side curtains.

Mark the center of the 30-foot pieces of PVC and also mark 6 feet on either side of



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How to Build a Hoop House, continued

Here are the materials and the estimated cost for you to build an 18-by-40 foot hoop house:

Qty.	Description	Estimated Cost (as of 2015)
33	1½ in. x 10 ft. sch40 Gray PVC pipe with bell end	\$150.00
10	1 in. x 20 ft. sch40 PVC pipe	\$110.00
6	2 x 4 x 10 ft. studs (for end framing)	\$20.00
16	2 x 4 x 8 ft. studs (for end framing)	\$50.00
8	1 x 4 x 10 ft. boards (hip board)	\$40.00
8	2 x 6 x 10 ft. baseboards	\$45.00
1	36-in. screen door (standard height)	\$50.00
1	100ft. roll of plastic plumbers strap	\$15.00
22	5ft. tall "T" posts	\$100.00
8	8 x 16 x 2 in. paving stones	\$10.00
4	18 x 3/8 in. iron rebar lengths	\$6.00
1	36 x 42 ft. 6 mil polymer cover	\$250.00
1	24 x 42 ft. 40% shade cover (optional)	\$200.00
2	10 x 20 ft. x .4 mil plastic sheet pieces	\$30.00
1	150-foot x 36-inch Galvanized poultry netting wire (optional)	\$60.00
1	PVC primer	\$4.00
1	PVC glue	\$3.00
1	Wiggle wire and wire lock channel	210.00

Assorted hardware **\$210.00**

1 box ½ in. staples; 1 box 100 count ¼ in. washers; 1 box 100 count ¼ in. nuts; 44 carriage bolts (¼ x 3 in.); 66 carriage bolts (¼ x 3½ in.); 4 carriage bolts (¼ x 4 in.); 2 pounds of 3-in. exterior screws or nails.

Approximate Total \$1,563.00



the center. This is where the purlins will be bolted to the hoops. Bend the 30-foot lengths of PVC pipe, creating an arch, and slip them over the "T" posts. Hold the purlins up and drill a 5/16-inch hole through both pieces of PVC. Use 3½-by-¼-inch carriage bolts to connect the purlins to the hoops (one purlin through the center and one purlin down each side, 6 feet from the center). Fasten the hip board in place using 3-inch carriage bolts, and attach the baseboard. The hip board should be bolted 3-4 feet from the ground (matching the width of the

poultry wire to be attached). Attach the baseboard to the PVC hoop with a 2 in. outdoor screw. Staple the poultry wire along both sides, attaching it to the hip board and baseboard.

Build the ends using the 2-by-4-inch studs. Join together a 10-foot and an 8-foot stud to use as the sill for each end. Place four paving stones equally spaced across each end, and lay your sill on the paving stones to keep them higher than the dirt. Find the center of the sill, and mark 18½ inches on both sides of center. Measure and mark again 40 inches farther. Measure vertically from the 18½-inch marks to the hoop, and cut a 10-foot stud for each of these marks. Hold the stud in place, and mark the top to notch out, fitting under the hoop. Use outdoor 3-inch deck screws to attach to the sill and the hoop. Repeat the same process for the 40-inch marks and repeat for the other end. One of the ends should

be framed to fit the 36-inch screen door. In cooler seasons, the door should be covered with polymer plastic. Install a short vertical near each end from the sill to the hip board, and screw in place. Frame around the top of the verticals for attaching the cover. Install horizontal bracing between



the vertical studs about 40 inches from the bottom. After the framing is complete, cover the ends with poultry wire. Drill 2½-inch holes in the base of each end frame, and drive the rebar (short for "reinforced bar") through the hole to secure the end in place. Additional bracing may be needed to help stabilize the structure during high winds and snow.

Finally, lay out the 36-by-42-foot plastic cover, and stretch it into place over the framework. This will require four people. One foot of plastic will extend beyond the bottom on each side. Use duct tape to attach the cover to the roll-up PVC, rolling it up to the base of the greenhouse. Use wire lock channel screwed to the wood frame and wiggle wire to secure plastic to the tunnel structure. Staples could be used but will rip the plastic when it is removed for ventilation and increase plastic costs, whereas channel and wiggle wire are more expensive up front, but will increase the life of the plastic. The plastic should be pulled tightly to the channel and then the wiggle wire put into place. ▀