How to Build a Simple Hoop House Cold Frame for Growing Native Plants Outdoors

by Rick Wukasch

Simple hoop houses can be an early season home in which to grow your own healthy, vigorous native plants. After all, native species are well adapted to growing outdoors in challenging conditions. They are lean and resilient when compared to the typically succulent, easily damaged, spindly plants grown indoors which need hardening off and careful management to prevent sun scald, wind damage, broken stems, and other hazards incurred in transplanting or movement to outdoors in spring.

Hoop house cold frames can easily be constructed in your yard or driveway, or upon already existing planter boxes or raised beds.

Here is a plan that worked for us in growing plants for native plant gardens.

Supplies needed for a 4'x8' free-standing hoop house

COST:

Each of these economical structures was easily made from readily available materials costing $60. Under inflation, expect that to be about $70-75.

How to save $ in construction materials:
IF you collaborate with another gardener to buy the materials and split the cost of items like screws, grommets, staples, rebar, plastic sheeting, plastic hose, etc., you will save and the cost be reduced to about $60 per cold frame.
We could often find used 2x4's and other useable scrap lumber in used skids or crating at lumber, furniture, hardware store yards or construction sites. If you ask permission, telling them what you are using it for, they usually have no problem giving that away.

This hoop house can easily be disassembled and stored indoors until needed the following year. Ours are in the rafters of the garage, in dormancy until needed again.

MATERIALS NEEDED:

16 ft. Heavy duty, 10' wide, clear plastic sheeting
- We've had 2 growing seasons out of this plastic, about three months per year, with at least another year or longer in its lifespan

3 2"x4"x8' pieces of wood
- 2 x 8' long foundations for the hoop house
- Third piece cut into two 4' lengths

2 2"x2"x8' pieces of wood, as insets for the rebar posts
2 1"x2"x8' pieces of wood, to assist anchoring and rolling/unrolling plastic sheeting
2 1"x3or4"x54" pieces of wood, as end caps for the long foundation pieces of 2x4
1 box of 2 1/2" square drive exterior wood screws
1 box of 1 1/2" square drive exterior wood screws

1 box of grommets to use as washers with screws securing plastic wrap onto wood
1 42 ft. black, poly plastic, ½ " ID. 75 psi white stripe flexible pipe (sold in 100 ft. rolls)
- cut one 12' length
- the remainder cut into 5 x 6' lengths

30" Metal wire for tying pipe together
10' 10M epoxy coated steel rebar cut into 1' lengths (usually sold in 8 and 4' lengths)
4 2" large binder clips
12 Bricks or paving stones to weigh down the cold frame when windy
2 8' pieces of scrap wood to lean stones or bricks against, protecting the plastic sheeting

TOOLS NEEDED:

- Power Drill with wood boring and regular Robertson drill bits
- Power grinder with cut off wheel
- Staple gun with 3/8" galvanized steel staples to fasten plastic to wood where needed
- Power (or hand) saw
- Scissors or knife to cut plastic
- Pliers or vice grip to cut and tighten wire

Construction



BUILDING THE FRAME

1. Using 2"x4"x8' pieces of wood

- Place 2 of the 2"x4"x8' pieces spaced 4' apart in parallel as the foundation for the length of the hoop house, with the 4" side of the 2x4 facing down to the ground.

- Cut the third piece of 2x4 in half to use as wrap-around axle for the opposite ends of the plastic sheet. Do NOT attach the wood to those ends, but roll the plastic around each singly on both ends as a weight which can be held down by stones or bricks in wind or to keep rabbits and pets out.

2. Using 2"x2"x8' pieces of wood
   - Screw the 2x2x8's onto the two 2"x4"x8' foundational pieces with 2 1/2 " screws, with the long edge of each piece aligned flush with each other.
   - The L shaped ledge forms the raised surface for stabilizing bricks to lean against, one side of the brick on the ground, the other on the 2x4 ledge. You might also protect the plastic sheeting by using a scrap board between the stone/brick and the ledge to hold hoop house in place when windy.
   - Position these foundation pieces with the high side facing each other in parallel
3. Place the 1"x3or4"x54" pieces of wood against the end of the 2 foundational pieces, and screw them together as end caps with 1 1/2 " screws, maintaining a 4' distance between the foundation pieces
4. Drill down through the 2x2s and into the 2x4s - 5 equally spaced holes on each foundation piece about 2 ½" deep, of large enough diameter to firmly anchor the 1' rebar pieces. The fit for the rebar pieces cannot be sloppy, as they must be anchored so as not to slide out easily by the force of wind.
5. Cut the rebar into 1' lengths, and push/hammer them into the holes bored in foundation pieces
6. Cutting the poly hose into 5 x 6' lengths, and one 12' length, insert the ends over the rebar to create a semicircular hoop, pushing downwards until the hose is wedged and will not pop off. Cut one 12' length, placing it over center crown of the 5 hoops, Place the 12' long piece of pipe over the 5 hoops, allowing 2' overlap on each end. Drill down through both pipes where they intersect, and anchor each with a 5" piece of wire. Twist wire tightly with pliers or vice grips, and bend back to prevent tearing the plastic or your skin by accident.

COVERING THE HOOP FRAME WITH PLASTIC




7. Spread the 16' long by 10' wide plastic sheeting over the hoop house frame, centering the middle of the 10' wide sheet along the 12' crown piece of piping, overhanging equally.
8. Place one 1"x2"x8' piece of wood in the middle of one 16' edge of the plastic sheeting (preferably the one on the windward side of the cold frame). Staple the plastic evenly at 6' intervals along the entire 8' length into the wood. Press the stapler down tightly to the wood to seat the staple squarely and flush with the wood and avoid play between plastic and wood. Roll the stapled plastic onto the wood axle several times.
9. Press the rolled axle of plastic on wood in between the end caps and tightly into the 45 degree angle created by the 2x2 rebar frame and the foundational 2x4. Pre-drill through the axle and into the foundational 2x4 at foot long intervals. Screw the wood pieces together with 2 ½ inch deck screws slid through grommets to hold the plastic more securely to the wood without tearing it.
10. Repeat the same procedure on the other side of the hoop house frame, attaching the plastic to the other free moving piece of 1x2 with staples every few inches along its length. Roll the plastic around the 1x2 axle and anchor it to the foundation piece of 2x4 with bricks. This can be used to facilitate watering and other procedures of plant inspection and care.

How to manage your hoop house

1. Roll back the 4' overlap of plastic at either end of the hoop house during higher temperatures and to increase air circulation and leaf drying after watering.
2. **Watering** - For watering or when temperatures are high, roll the entire plastic cover over the hoop house, securing it with bricks on the other side. Overhead watering is easier rather than spraying water in by hose from either end of the cold frame. It's much easier roll and unroll when a person is on either end of the 1x2 axle!
3. **Ventilation -** The plastic overhang at both ends of each hoop house can either be rolled up and clipped to pipes that form the end hoops with binder clips, or pulled across the entire frame, almost meeting in the middle, and then anchoring the flaps down onto the foundation boards with bricks, or with binder clips onto the cross ribs of poly pipe. At night, the overhanging plastic can be rolled onto the 4' long pieces of 2x4 and anchored to the ground under bricks to keep out wind, pets, "wascally wabbits"and keep the plants warm. Do NOT attach the 2x4x4' wood pieces to those ends, but roll the plastic around them as a weight which can be held down by stones or bricks.

4. **Access -** You can access the inside of the cold frame from either end, pushing trays of cups together snugly to fill the frames up. Alternatively, roll up the long side axle and put in flats, or water/fertilize from above.
5. **Temperature control -** Monitor the weather carefully for excessive temperature, or night frosts and sub-zero events. Roll up the plastic during hot daytime temperatures to avoid undue stress and scalding, and unroll to cover the hoop house during cold, windy, or freezing conditions when seedlings were vulnerable. **DO NOT LET THE HOOP HOUSE OVERHEAT!** We lost a few plants by forgetting to monitor heat on a sunny, calm day.
6. **Hardening off** - Be assured that, compared to our vegetable transplants, these natives are hardy little things, well-suited for fluctuating spring conditions. In early spring during warmer days, the plastic sheeting at the ends of these cold frames were rolled up and clipped (using large binder clips) to the end hoop for air circulation; at night, unrolled to keep the warm in. When near freezing, we occasionally pulled a tarp over all the hoop houses as an extra layer of protection.

by Rick Wukasch, Nov. 2021