

Simple, low-cost LOW TUNNEL can add weeks to growing season

Brian Sebade

Consider using a low tunnel if Wyoming's short growing seasons and low temperatures make growing vegetables a struggle.

Low tunnels are similar to high tunnels, except much smaller (and less expensive – see the simple design), so they require fewer initial inputs (time, money). Low tunnels capture energy from the sun and provide that extra heat to the soil and air to increase plant growth and provide protection from frost and cold temperatures.

Low tunnels can add two to three weeks to the spring and fall growing season. When temperatures become too hot, usually greater than 60 degrees, the plastic can be flipped back during the day and then pulled back to insulate plants from cooler nighttime temperatures.

Temperatures can rise very quickly in these structures due to our state's clear skies and intense sunlight. Don't let temperatures inside low tunnels rise to the point they cause plants heat stress or "cook" them.

The plastic can be completely removed during the hotter days of summer or left attached with the plastic pulled back. Leaving the plastic



See page 14 for directions to build this low-cost low tunnel.

attached but open (acting as walls of plastic around the base of the structure) during the summer provides added protection from the wind. This can increase vegetable growing success in the windier areas of our state.

Acclimating Plants

Low tunnels provide an environment that is warm, has high humidity, and no wind. Vegetables enjoy this environment and will often be "shocked" when the plastic is removed. Avoid this by acclimating plants, gradually exposing them

to different temperatures or other climatic conditions such as wind. Do this by lifting the plastic up for several hours during the heat of the day and securing the plastic at night. Gradually extend the time the plastic is open.

You may need to water more to make up for the increased water loss of opening the tunnels. Leaving the plastic on longer during the growing season tends to benefit warm-season crops (tomatoes, peppers, squash, etc.). Cool-season crops (peas, lettuce, spinach, etc.) do not benefit as much, if the plastic is kept on too long, and too much heat may hurt yield or quality. Keep in mind some crops may not work well for small low tunnels such as corn, squash, and indeterminate varieties of tomatoes that require lots of space.

The vegetables aren't the only things that will like the warm, moist environment. There is a good chance bacterial issues with plants and other unwanted pests such as slugs will increase. Anti-drip plastic, which is more expensive, can help reduce the amount of water sitting on plant leaves (leaves that remain too wet for too long provide great conditions for certain plant diseases). Drip irrigation is preferred over sprinklers in low tunnels for this reason.



Figure 1. Brian Sebade builds a low tunnel during a conference. Low tunnels can be built directly onsite or offsite and moved to a garden.

Simple low tunnel design 8-foot by 4-foot

There are many options for building your own low tunnel from supplies at local lumber and hardware stores. This is just one of many styles and shapes. Please check with local ordinances regarding the size allowed for structures similar to the taller low tunnel pictured. Please avoid using wood that has been treated with stains or other chemicals.

The size and dimensions can be changed easily. Most designs will range from 3 to 6 feet in height. Plastic can be very expensive or fairly inexpensive (See “Material list for a simple low tunnel”). If properly installed (and without any large hail events) expect one to two years of life from 4 and 6 mil clear plastics found at most hardware stores, and longer for more expensive plastics.

Directions

Cut one 8-foot 2x6-inch board in half. Make a rectangle with this and the other two 8-foot 2x6 boards and attach using three 3-inch screws in each end (Figure 1). Next, bend the three 10-foot long pieces of PVC into a rainbow-shaped arc to make hoops. Cut 2x4s for each side so when stood upright they are even with the tops of hoops on both ends (Figure 2).



Figure 2. Attach the ribs to the 2x4 frame using 2-inch screws. The PVC ribs help support the plastic covering.



Figure 3. The wiggly wire helps secure the plastic and can be released to move the plastic covering up or down.

Place the remaining 8-foot 2x4 on top of the two side uprights and attach with 3-inch screws. Secure the hoops to the raised bed frame using two 2-inch screws at all bases of the PVC and one screw into the top 2x4 plate.

Next, attach the plastic with the cedar fencing boards (using 1.5-inch screws) that have been cut in half length-wise. The plastic will be attached on the upright 2x4, the top plate 2x4, and on one half of the exterior of the raised bed base.

Once the plastic has been secured, attach the frame for the wiggle wire around the sides of the raised bed frame. A strong string or wire can be attached on the inside of hoops for climbing plants such as peas, climbing beans, and cucumbers.

Material list for a simple low tunnel:

- .5 pound 1.5 inch screws
- .5 pound 2 inch screws
- .5 pound 3 inch screws
- 3 – 10 foot pieces of 1-inch PVC pipe
- 3 – 8 foot 2x6 boards (not treated wood)
- 3 – 8 foot 2x4 boards
- 5 – 6¾ inch cedar fence boards (ripped in half for securing plastic)
- 1 – metal drill bit
- 4 – 6 foot lock channel for wiggle wire
- 3 – 6 foot wiggle wire section
- 1 – roll of clear plastic of your choosing

Approximate pricing:

- 6 mil plastic, anti-condensation, and four-year life expectancy \$95 for 12-foot x 55-foot (other plastics can be purchased for around \$20-\$30 at smaller sizes but will most likely only last one to two years)
- Wiggle wire and channel – \$30
- Lumber and materials – \$75-90

Tools:

- Level
- Tape
- Saw
- Metal drill bit for wiggle wire channel
- Drill
- Knife



Wiggle wire secures the plastic but can also be removed to allow lifting the cover for ventilation on hot days.



Weeding and managing crops in the back of a low tunnel can be difficult.

*A man of varying tastes, University of Wyoming Extension educator **Brian Sebade** in our last issue was eyeing edible weeds outside for salads and now moves inside to raise vegetables for this story. He serves southeast Wyoming and can be reached at (307) 721-2571 or bsebade@uwyo.edu.*