Quick Hoops™ Low Tunnel Bender: 3-ft. x 4½-ft. Instruction Manual

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The Quick Hoops™ Low Tunnel Benders provide hoophouse-style protection at a much lower cost. The 3-foot Bender model easily creates hoops ranging from 3-feet wide all the way up to 6 feet. These different configurations have multiple applications from extending the growing season for cold-hardy crops with a very late season harvest or overwintering them for earliest possible spring harvest, and for different bed widths, to protecting flowers from rain damage on the petals. Note that only the 3-foot configuration is suitable for shedding snow loads.



3-ft. Low Tunnel over flower trials



The different hoops that can be made with the 3-ft. Bender

Materials Included:

- Curved bender
- (2) ¼-inch x 5-inch lag screws for mounting to wood surfaces and (2) ¼-inch x 4½-inch carriage bolts, nuts, and washers for mounting to metal surfaces
- Detailed instructions

½-inch EMT conduit is recommended for most applications, and can be purchased at your local home improvement store or electrical supply house in the 10-foot lengths needed to construct the low tunnels.

This bender also bends ¾- or 1-inch conduit, which can be useful to provide extra strength for tunnel ends, or for fabricating small seed starting chambers and mini greenhouses.

Not all EMT conduit is manufactured with the exact same base alloys or wall thicknesses. If using EMT from two different sources, you may notice a difference in finished hoop widths. Hoops can easily be made uniform by compressing them inward or expanding them outward.

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Mounting:

Quick Hoops Benders may be mounted to any solid surface, such as the corner of a shop workbench, a picnic table, or hay wagon. It may be lag-screwed or thru-bolted into place. There are two $^{5}/_{16}$-inch mounting holes in the benders for the ¼-inch lag screws or bolts that are included. By securing the bender in a fixed position, and pulling the tubing around the bender, the operator can maintain precise control of the tubing being bent.



Mount your Quick Hoops Bender securely to any flat work surface that is stable and will not move. Ensure there is adequate room on either end of the bender for the tubing to be inserted and slid through.

Operation:

To create a 3-foot hoop: From 10-foot long EMT, you can create 3-foot wide hoops that are 4½-feet tall (before being inserted into the ground), and easily spans one 30-inch bed.

1. Begin by marking a 10-foot length of EMT at 28 inches and 42 inches from the same end.



2. Insert the marked end of the EMT into the holding strap of the bender to the 42-inch mark, as shown to the right.

3. Making sure that the EMT is resting squarely in the center valley of the bender, pull the unmarked end all the way around the bender until it just barely contacts the end of the frame.



4. Pull the partially bent pipe through the holding strap so that the 28-inch mark lines up with the holding strap, as shown.



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5. Pull the EMT toward you around the bender a second time, bending the EMT around the bender until it is almost touching the frame.



6. If the sides of the hoop are not parallel to each other, adjust them by compressing or stretching them until you are satisfied with the final result.







To create 4-foot, 5-foot, and 6-foot hoops:

1. The process for bending hoops with greater widths varies slightly from that for the 3-foot wide configuration. The only difference in the procedure for creating these larger width hoops is where the marks are made.

For these, you will need to mark both ends of the EMT.

a. For 4-foot wide x 4-foot tall hoops: Make a mark 21 inches from both ends.
b. For 5-foot wide x 3½-foot tall hoops: Make a mark 15 inches from both ends.
c. For 6-foot wide x 3-foot tall hoops: Make a mark 9 inches from both ends.



2. Insert one end of the EMT into the holding strap until it lines up with the mark.

3. Pull the end of the EMT around the bender until it creates an L shape. The goal is to bend until the top of the hoop and legs are perpendicular.

4. Remove the EMT and repeat steps 2 and 3 for the opposite end.



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5. To help speed up the process, make a small mark on the bender that corresponds to the last point the EMT touches. This will become the reference point for all future hoops, and will indicate where you should stop bending the EMT to achieve the perpendicular angle.



Use in the field:

Quick Hoops Low Tunnels are generally driven about 10 inches into the ground and spaced 5–6 feet apart. You may find it helpful to use a digging bar to prepare holes to accept the tubing, if your soil is not very loose or is rocky. Cover with Agribon spun-bonded row cover and eventually top with greenhouse film for overwinter protection.

A great deal of information on the use and implementation of the Quick Hoops Low Tunnel growing system, including suggested varieties and planting dates can be found in Eliot Coleman's book ***The Winter Harvest Handbook***.



Fall crops under 4-foot hoops and Tufflite IV Greenhouse Film at the source research farm.

Additional Materials and their uses:

Agribon+ Spun-Bonded Row Covers

AG-15: *Lightweight grade for insect control in the summer.* 90% light transmission. 0.45 oz./sq.yd.

AG-19: *Standard grade for general frost protection and insect control in early spring and when frost is expected.* Frost protection down to 28°F/-2°C. 85% light transmission. 0.55 oz./sq.yd.

AG-30: *Overwintering protection in moderate climates.* Frost protection down to 26°F/-3°C. 70% light transmission. 0.9 oz./sq.yd.

AG-50: *Overwintering protection in colder climates.* Frost protection down to 24°F/-4°C. 50% light transmission. 1.5 oz./sq.yd.

AG-70: *Heaviest overwintering and freeze protection.* Frost protection down to 24°F/-4°C and below. 30% light transmission. 2.0 oz./sq.yd.

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Clear Polyethylene Greenhouse Film

UV resistant and ultra clear, this 4 mil, high-quality, high-tech film designed specifically for greenhouses is perfect for use with low tunnels. Provides optimum light transmission and resists yellowing. Extremely durable for long winters. Place on top of row cover to allow very late harvest, over-wintering, or spring germination. The plastic film is usually secured with sand bags or some other type of weight placed at the edge of each hoop to prevent tearing.

Knitted Shade Cloth

Reduces heat and light intensity, resulting in better quality and higher yields for crops; speeds growth of cool weather fall crops, prevents bolting and bitterness of heat-sensitive crops; and protects against wind damage and desiccation. 100% UV stabilized black polyethylene; naturally rot and mildew proof. This lock-stitch knitted shade cloth is lighter weight, and has better ventilation and water permeation than woven shade cloth, and can be cut without unraveling. 5–7-year lifespan. Can reduce ambient temperature by 10°F or more. Must hang high enough above plants and provide adequate side ventilation to prevent heat build-up. 10-foot width is used over low tunnels, with the sides uncovered for maximum ventilation; and secures easily with Snap Clamps (see below).

Securing Row Covers, Plastic, and Shade Cloth:

Coverings in general can be held down by a variety of methods, including sandbags (available at www.uline.com, among other sources), snap clamps, heavy-duty row cover hand pegs, rocks, or a dug trench along the edge of the hoops to bury the edges of the cover.

Row Cover Hand Pegs



Holds row cover firmly in place, even in the strongest winds. For best performance, place at the base of hoop support with the long prong puncturing just inside the rolled edge of the row cover, with one small barb through the fabric and the other directly into the soil.

Snap Clamps

Quickly fasten greenhouse plastic, row cover, or shade cloth to Quick Hoops Low Tunnels and other low tunnels made of EMT or PVC pipe. Space clamps about 1 foot apart or closer in windy situations. UV stabilized and frost resistant for years of dependable use.



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Over-Winter Set Up:

Note: The images shown depict hoops bent with the 4-foot wide x 4-foot high model of Low Tunnel Benders. Although they are a different shape, the set-up process is the same.



Extra care must be taken to prepare Quick Hoops Low Tunnels for service through the winter. Once a bed is planted, low tunnels made of ½-inch EMT are generally placed at intervals of 5 feet and driven 8–10 inches into the ground.

If your soil is dense or rocky, you may find the use of a digging bar to “predrill” holes for the hoops helpful. If you are using 10-foot x 100-foot greenhouse film, you will want the tunnels to be no more than 85-foot long from end hoop to end hoop (18 hoops total), in order to allow for enough excess material at each end. It is important to note that longer tunnels will have a lower surface area to volume ratio and will be on average effectively warmer overall for the crops within them.

A good solid stake of some kind should be placed at each end at a 45-degree angle pointing away from the tunnel; wood is preferable over rebar, unless driven very deep, because rebar will slice through wet soil and often pull out in wet spring storms.

For extra support and to prevent crops from being crushed, we add a cord or rope from the top of each end hoop down to the neighboring stake as shown above. In our experience, the EMT hoops will not bend under snow load, but due to their thin nature, they will (like the rebar) slice through the soil when under load, particularly the end hoops, which carry the load of the entire tunnel.



Fill sand bags with sand or rocks, not soil. Soil will dry out and the bags will become too light to function properly, especially in high wind.

Spread the row cover over the hoops; 10–15 feet wide is ideal. Do not cut to length yet. Bunch up the end that is opposite to the roll and tie it off to the stake nearest it. Return to the opposite end.

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Pull the row cover tight lengthwise, with the logo lettering in the top center of the hoops — it indicates the center, and you will have equal overlap on each side for sand bags to sit on.



While pulling it tight lengthwise, hold it just past the stake on that end and neatly gather each side of the fabric to the stake, then tie that end off and cut the fabric to length.



Add sand bags at the base of each hoop and on each side between the end hoop and end stake. Soil may also be added intermittently between hoops to prevent wind from catching fabric.

As winter approaches, add plastic on top of the row cover by repeating the same procedure. Bunch the together and tie to the stake, separate from the row cover. If you were to untie the row cover, bunch and tie them, the coverings will slip over each other in the knot and become loose, causing the tunnel to collect snow rather than shed it.

Repeat for the other end, centering the plastic, and pulling it as tightly as possible lengthwise, before tying.

Cut to length. Then add sand bags. The side bags should be on top of both coverings, against the hoops.

Storm preparation tips: Difficulties in keeping coverings on are generally encountered during late fall or early spring storms. Once snowfall occurs, there will be added weight to hold down the plastic and the tunnels should be maintenance free until the snow melts.

If you have an unprotected field that tends to catch a lot of wind, 1-inch x 1-inch grade stakes may be added to allow lacing in a crisscross pattern over of the plastic (see upper right). This should enable the tunnels to weather most tough storms without previously having accumulated snow.





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