MAKING A LOW TUNNEL

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A low tunnel can easily be made by placing plastic or wire hoops over a bed and covering with greenhouse-grade plastic or row cover. In general, the peak height of the hoop should be approximately half a foot higher than the tallest plants in the bed to allow for sufficient air circulation. See Table 1 for a list of common bed widths, hoop lengths and peak heights.

Table 1.

Bed width	Hoop length	Peak height
3 feet	6 1/2 feet	40 inches
3 1/2 feet	6 1/2 feet	28 inches
4 feet	6 1/2 feet	26 inches
3 feet	7 feet	32 inches
3 1/2 feet	7 feet	31 inches
4 feet	7 feet	29 inches

Hoops

Plastic hoops can be attached to a wooden frame (Figure 1) or placed over rebar in the soil (Figure 2). Make hoops from 3/4-inch diameter 'advance drainage systems' (ADS) polyflex tubing or from acrylonitrile-butadiene-styrene (ABS) tubing. Both are used for plumbing, are made from polyethylene, and are most commonly sold in lengths of 100-feet by many hardware stores. ABS tubing is more rigid than ADS and so is not suitable for very low tunnels. Use a 3/4-inch electrical metallic tubing (EMT) strap to hold the hoop to the wooden frame. Use a 1 foot piece of No. 4 rebar (approximately 1/2-inch diameter) placed 8 inches into the ground to hold the hoop directly on the soil.

Heavy gauge galvanized 9-gauge wire is suitable for making hoops for a low tunnel (Figure 3). Wire can be purchased in coils which are cut to get hoops that are 63-inches long. A 60-foot coil will give 11 hoops, and a 350-foot coil will give 67 hoops. Straight pieces of 9-gauge, galvanized steel wire, each 76-inches long, can be purchased in packages of 100. Hoops are easily stored on a barn or shed wall (Figure 4).

Tunnel Covers

Plastic and row cover fabric are both commonly used to cover low tunnels (Figure 5). Plastic is most often used during the fall, winter, and spring. However, when temperature exceeds 50 ^{o}F and there is direct sunlight, the temperature within a plastic-covered low tunnel can be up to 30 ^{o}F higher than the surrounding air, which can lead to crop damage. Therefore it is necessary to open the tunnel along its side or top on sunny and warm days. Row cover is most often used during the late spring, throughout the summer, and during the early fall.

Plastic comes in various thicknesses and dimensions, and attributes such as UV-light protection are often added to make it more durable and conducive for agricultural uses. Row cover also comes in various thicknesses, which offer varying levels of frost protection. Whether you are using plastic or row cover, night temperatures in a low tunnel will be equivalent to the surrounding air temperature. Thus, only plant cold hardy crops in a low tunnel during the cold periods of the year.

The price of plastic and row cover varies considerably based on thickness and size, as well as source. Table 2 includes a list of supplies for low tunnels, including costs based on internet searches (updated Spring 2013).

Table 2.

Item	Size	Cost*
Hoops		
ADS or ABS tubing	3/4-inch diameter x 100-ft length	$ 18
EMT straps	3/4-inch, 20 per packet	$ 3
Rebar	1/2-inch diameter x 1-ft length	$ 0.58
Wire	9-guage x 76-in, 100 hoops	$ 75
Wire	9-guage x 60-feet, 11 hoops	$ 29
Wire	9-guage x 350-feet, 66 hoops	$ 17
Plastic		
Tufflite IV Clear	6 mil, 40-ft x 200-ft l	$ 398
Tufflite Nursery Clear, UV resistant and ultra clear	4 mil, 10-ft x 100-ft	$ 77
Tufflite IR Infrared	6 mil, 20-ft x 100-ft	$ 269
Tufflite IR Infrared	6 mil, 20-ft x 5-ft increments	$ 4
Sun Master® 70% Opacity Film, 1 year UV protection	3 mil, 40-ft x 110-ft l	$ 235
Sun Master® Clear Film, 1 year UV protection	3 mil, 40-ft x 110-ft l	$2375
Solexx™ Greenhouse Rolls	3 mil, 4-ft x 24-ft or 40-ft	$ 148
Solexx™ Greenhouse Rolls	5 mil, 4-ft x 20-ft to 40-ft	$ 197
Solexx™ Greenhouse Rolls	5 mil, 4-ft x 96-ft to 120-ft	$ 759
Blue Hawk Construction Film	4 mil, 20-ft x 100-ft	$ 78
Blue Hawk Construction Film	6 mil, 20-ft x 100-ft	$ 98
Row Cover		
Reemay, 75% light transmission, to 30^{o}F	0.6 oz/sq yd, 67-in x 20-ft	$ 16
Reemay, 75% light transmission, to 30^{o}F	0.6 oz/sq yd, 67-in x 50-ft	$ 25
Agribon+ AG-19, 85% light transmission, to 28^{o}F	0,55 oz/sq yd, 83-in x 50-ft	$ 22
Agribon+ AG-19, 85% light transmission, to 28^{o}F	0,55 oz/sq yd, 83-in x 250-ft	$ 49
Agribon+ AG-30, 70% light transmission, to 26^{o}F	0,90 oz/sq yd, 83-in x 250-ft	$ 105
Agribon+ AG-50, 50% light transmission, to 24^{o}F	1,50 oz/sq yd, 83-in x 500-ft	$ 239
Agribon+ AG-70, 30% light transmission, to 24 ^{o}F	2.00 oz/sq yd, 13-ft x 100-ft	$ 109
Typar® Xavan^{TM} T5131, 70% light transmission, to 26 ^{o}F	1.25 oz/sq yd, 15-ft x 100-ft	$ 139
AgroFabric Pro-19, 95% light transmission, to 28 ^{o}F	0.55 oz/sq yd, 90-in x 100-ft	$ 29
AgroFabric Pro-42, 60% light transmission, to 26 ^{o}F	1.25 oz/sq yd, 90-in x 100-ft	$ 57

***** Costs are based on prices in spring 2013, and do not include sales tax or shipping and handling; costs are provided only as a guide.

Figure 1. Plastic hoops attached to a wooden frame (left) using an EMT strap (right).

Figure 2. Plastic hoops placed over pipe or rebar in the soil (left)

Figure 3. Wire hoops covered with row cover (left) and low tunnels made with thin light-weight plastic (right). Note that on the right, plastic is placed over the plastic hoop and wire hoops are placed over the plastic to keep the plastic in place.

Figure 4. Hoops are easily stored on a shed wall.

Figure 5. Low tunnels covered with greenhouse-grade plastic (left) or row cover (right).