Caterpillar Tunnels at Windflower Farm

by Ted Blomgren
Who we are...
Where we are... 175 miles north of New York City
What we do...
vegetable shares
Flower, egg, fruit and winter shares...
The last of our short stake tomatoes in 3-row caterpillars
December greens transplanted approximately October 1st following summer tomatoes
Inspired by Elliot Coleman’s New Organic Grower
Caterpillars are probably more akin to low tunnels than high tunnels. They are 3-season structures.
...and, while low-cost, they involve a fair amount of "management"
Caterpillars and low tunnels are not snow bearing structures like this Ledgewood structure.
...they should be taken down in a timely fashion
These tunnels are oriented so their “gables” face the wind.
Ventilation is accomplished by rolling up the sides. There is no “door” – getting inside involves bending.
10 X 138’ Caterpillar Tunnel Using PVC Bows
Materials for one 10 X 138’ Caterpillar Tunnel (6’ bow spacing)

1 pc. 28 X 150’ 6 mil greenhouse plastic ($325, shop for better size and price, but not thickness)

24 pc. 1 .5” X 20’ Schedule 40 PVC hoops ($192)

13 pc. 10’ chain link top rail steel to make 48 pc. 30” ground stakes plus 2 48” pc. end stakes ($130)

46 pc. tie down anchor screws ($184)

8 pc. ¼” X 100’ braided nylon rope for the ridge rope and to make 23 over-the-top ropes ($64)

Material Cost Total $895 ($ .65/ft²)
15 X 184’ Caterpillar Tunnel Using Purchased Steel Bows (8’ bow spacing)

- 2 pc. 28 X 100’ 6 mil greenhouse plastic ($398)
- 24 pc. bows from Rimol Greenhouse Company’s ‘Catamount’ Tunnel (1.3” steel, $1,312*)
- 48 pc. 24” ground stakes (1.6” steel, included in price above)
- 1 pc. 8’ chain link fence steel (1.6”) for two 48” end stakes ($12)
- 1 pc. 12’ section wiggle wire base and wire ($20)
- 46 pc. tie down anchor screws ($184)
- 12 pc. ¼” X 100’ braided nylon rope for the ridge rope and to make 23 over-the-top ropes ($96)

Material Cost Total $2,022 ($0.73/ft²)
A look at the greens in our winter share.
Kale, chard, tatsoi generate similar yields and economics... about 800 bunches from 2 beds (5-row beds at 8” apart) in our 138’ caterpillar tunnel X $3.00/bunch = $2400.00 in December
Kale, chard, tatsoi generate about 2000 bunches from 5 beds (5-row beds at 8” apart) in our 144’ high tunnel X $3.00/bunch = $6,000.00 during the months of January and February.
Construction details…
High tunnels produce beautiful crops…
Snapdragons also grow tall inside Caterpillar tunnels and are ready for harvest early enough for three crops (peppers or cucumbers followed by lettuce or a cooking green)
Low tunnels (calendula) and Caterpillar tunnels (snapdragons)
The calendula has outgrown its tunnel and is ready for harvest
What do our shareholders want?

Tomatoes, lettuces, sweet corn, cucumbers, carrots, broccoli, colorful peppers, squashes, onions, melons...

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<tr>
<th>Crop</th>
<th>Low Tunnel</th>
<th>Caterpillar</th>
<th>High Tunnel</th>
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<td>Cucumber</td>
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<td>Squash</td>
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<td>Spring Greens</td>
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Peppers
‘Socrates’ peppers planted after snapdragon harvest using the same Biotello mulch and drip lines
Our customers are looking for colorful sweet peppers. These peppers are growing in 2-row beds at about 14” apart.
When peppers have finished yielding, lettuce or a cooking green is planted in its place
Peppers growing in single rows in a ‘Solo’ tunnel at Norwich Meadows Farm
Peppers growing in Caterpillars at Windflower Farm. These 15 x 180’ tunnels have three 2-bed rows.
Inside the 15 X 180 Pepper tunnels.
A box–style trellis helps keep plants upright.
Eggplants
Eggplant responds to both low and high tunnels. To ensure a good crop, we grow all of our eggplants in Caterpillar tunnels.
Tomatoes
Short stake tomatoes in 3 beds in a 15 X 200’ walk-in tunnels
In 2009, late blight ruined outdoor plantings of tomatoes. Tomatoes grown in Caterpillars produced 50% yields and those inside high tunnels produced nearly 90%.
We plant 2 rows per tunnel in the 10’ PVC units. In-row spacing is 24” These varieties are ‘Juliet,’ ‘Gold Rave’ and ‘Black Cherry.’
Greenhouse varieties with trellis line attached to the frame of a high tunnel is certainly easier.
Tall stakes and the Florida weave were used for trellising.
A neighbor suggested two rope “purlins” for trellis supports.
Pathways are mulched with straw and hand weeded.
Landscape fabric can also be used to suppress weeds.
Leaf mold is a disease that takes place when tomatoes are grown with high humidity. The remedy is to ventilate.
Cucumbers
Cucumbers planted into decaying Biotello left after harvest of an early cut flower or greens crop
Cucumbers can be planted into a Caterpillar tunnel very early (early May under an interior low tunnel) or following an early cut flower or greens crop.
Trellising improves tunnel access, harvest ease, cucumber yields and fruit quality
A late planting of cucumbers trellised on Hortnova netting and mulched with Biotello and old hay.
Low tunnel cucumbers
Zucchini
Low tunnel summer squashes
Earliness and disease suppression
Melons in a Caterpillar tunnel at Norwich Meadows Farm
Cut Flowers
SARE Trial: China aster performed well in the high tunnel (>36” stems) and in the plastic-covered walk-in tunnel (>36”), fairly well in the Typar-covered walk-in tunnel (>24”), and the low tunnel (about 24”), but they performed poorly (about 18”) when left uncovered in the field.
These low tunnels will be covered to protect China asters from aster leafhoppers and tarnished plant bugs. Spun bonded row covers or a woven netting might be used.
This 100’ structure contains two 4-row beds of sunflowers planted two seeds per cell at 8” intervals; we retail the 2000 stems for about $1500
Earliness in cut sunflowers can be achieved by using…

…transplants, raised beds, and mulch (EARLY)

…plus low tunnels (EARLIER)

…or a Caterpillar tunnel (EARLIEST)
Caterpillar Tunnel

Low Tunnel
Lettuces
Typar is a suitable cover for fall greens, but it is not as warm or strong as 6 mil greenhouse plastic.
Greens under a floating row cover. Leaves touching the cover can be damaged.
This $500 structure contains three 3-row beds of lettuce planted in multi-cells at 8” intervals; when planted to head lettuce, this 200’ unit yields 2500 units.
Greens
‘Magenta’ and ‘Mottistone’ lettuces for late fall harvest
Kale, ‘Yukina Savoy,’ and arugula, among other greens, perform well in low tunnels deep into the fall.
‘Tatsoi’ and arugula for fall and early winter harvest
‘Vitamin Green,’ ‘Yukina Savoy,’ and ‘Tokyo Bekana’ growing in a “multi-bay” low tunnel
Swiss chard planted in landscape fabric (above) and in bare ground. Harvest is done by removing individual leaves for bunching.
Red bok choy (left) planted for fall harvest following a tomato crop. With low hoops and 9 oz. row cover, the crop was free of frost damage through early January. Choy in low tunnels (below).
Sweet potatoes (‘Beauregard’ and ‘Covington’) do well under some kind of cover. Low tunnels and Caterpillars both boost yields and earliness.
Scallions for fall and winter harvest
Field work can be performed with machinery prior to tunnel construction.
Spring lettuces under casual low tunnels
Caterpillars under construction over existing beds of lettuces. Typar is an alternative covering.
Lettuces respond to tunnels in the spring and in the fall. Powdery mildew and downy mildew can both cause problems.