University of Nevada Cooperative Extension
Presented By
Victor Williams
Randy Emm
CONSTRUCTING A LOW COST HIGH TUNNEL HOOP HOUSE

• The hoop house gets its name from its shape. This structure was engineered by Utah State University Cooperative Extension. This structure is an alternative to more expensive engineered steel structures and is not as sturdy.
• You will need preferably a electric miter saw, electric screw driver, electric drill, drill bits, a 1-1/4” hole drill bit, 25 foot measuring tape, 100 foot measuring tape, a square, tin snips, sledge hammer, steel post driver and paint brushes or rollers.
SITE SELECTION

• The high tunnel is designed for intensively managing a small area and site selection is critical. It should be located in well drained soil that is fertile and free of pathogens, weeds and other problems. The site should not be shaded on the south and west sides. It should be located near a year-round water source. Access to power may be beneficial. Consider the surrounding area so the structure will be protected against high winds and heavy snow. Position the hoop house so the air currents will help ventilate the hot air buildup.

• While the end walls can be constructed by one person, extra hands will be needed to cover the tunnel with plastic and to help fasten the plastic to the end walls. Extra hands will be beneficial throughout construction.

• Utilizing recycled lumber and other materials can greatly reduce the cost of the high tunnel hoop house.
### Low Cost Hoop House Materials (84 Foot Hoop House) Cost Estimates

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green House Plastic (327.85/100ft)</td>
<td>1 roll</td>
<td>$327.85</td>
</tr>
<tr>
<td>Rebar ($3.00/2ft)</td>
<td>58 ea</td>
<td>$174.00</td>
</tr>
<tr>
<td>PVC 1” schedule 40 ($7.16/20ft)</td>
<td>37 ea</td>
<td>$264.92</td>
</tr>
<tr>
<td>Tee, short 1” ($7.59/ea)</td>
<td>2 ea</td>
<td>$15.20</td>
</tr>
<tr>
<td>Cross connectors for 1.315” pipe ($3.50/ea)</td>
<td>27 ea</td>
<td>$94.50</td>
</tr>
<tr>
<td>PVC Glue</td>
<td>1 cn</td>
<td>$5.00</td>
</tr>
<tr>
<td>Paint</td>
<td>1 cn</td>
<td>$20.00</td>
</tr>
<tr>
<td>8’ 2 x 4 lumber ($2.47/ea)</td>
<td>8 ea</td>
<td>$19.76</td>
</tr>
<tr>
<td>10’ 2x4 lumber ($3.08/ea)</td>
<td>4 ea</td>
<td>$12.32</td>
</tr>
<tr>
<td>16’ 2x4 green lumber (7.39/ea)</td>
<td>2 ea</td>
<td>$14.78</td>
</tr>
<tr>
<td>Lathe 4’ 50/bundle (Need 22 pieces)</td>
<td>1 bd</td>
<td>$20.44</td>
</tr>
<tr>
<td>Wood Screw 3”</td>
<td>1 bx</td>
<td>$17.00</td>
</tr>
<tr>
<td>Wood Screw 1-5/8”</td>
<td>1 bx</td>
<td>$17.00</td>
</tr>
<tr>
<td>Steel Posts ($ 5.00)</td>
<td>4 ea</td>
<td>$20.00</td>
</tr>
<tr>
<td>Plumbers Tape( 1”x 10’)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bailing Twine (recycled)</td>
<td>1 roll</td>
<td>$2.30</td>
</tr>
</tbody>
</table>

**Sub total** $1,030.07

### Top Vent Door Material

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>8’ 2x4 lumber ($2.47/ea)</td>
<td>8 ea</td>
<td>$19.76</td>
</tr>
<tr>
<td>10’ 2x4 lumber ($3.08/Ea)</td>
<td>4 ea</td>
<td>$12.32</td>
</tr>
<tr>
<td>Hinges ($5.00/ea)</td>
<td>8 ea</td>
<td>$40.00</td>
</tr>
<tr>
<td>Gate latch 6” ($3.45/ea)</td>
<td>2 ea</td>
<td>$6.90</td>
</tr>
<tr>
<td>Bolt latch 4” ($7.75/ea)</td>
<td>4 ea</td>
<td>$31.00</td>
</tr>
<tr>
<td>Duct Tape</td>
<td>1 roll</td>
<td>$4.00</td>
</tr>
</tbody>
</table>

**Sub total** $113.98

**Total materials for hoop house** $1,139.05

Cost of materials will vary according to size of hoop house, location and vendors. Cost of lumber and materials for end walls and doors will be the same regardless of length.
### Low Cost Hoop House Materials (33 Foot Hoop House) Cost Estimates

- **Green House Plastic (3.85/ft)**
  - 50 ft. $192.50
- **Rebar ($3.00/2ft)**
  - 24 ea $72.00
- **PVC 1” schedule 40 ($7.16/20ft)**
  - 16 ea $114.56
- **Tee, short 1” ($7.59/ea)**
  - 2 ea $15.20
- **Cross connectors for 1.315” pipe ($3.50/ea)**
  - 10 ea $35.00
- **PVC Glue**
  - 1 cn $5.00
- **Paint**
  - 1 cn $20.00
- **8’ 2 x 4 lumber ($2.47/ea)**
  - 8 ea $19.76
- **10’ 2x4 lumber ($3.08/ea)**
  - 4 ea $12.32
- **16’ 2x4 green lumber (7.39/ea)**
  - 2 ea $14.78
- **Lathe 4’ 50/bundle (Need 22 pieces)**
  - 1 bd $20.44
- **Wood Screw 3”**
  - 1 bx $17.00
- **Wood Screw 1-5/8”**
  - 1 bx $17.00
- **Steel Posts ($ 5.00)**
  - 4 ea $20.00
- **Plumbers Tape (1”x 10’)**
  - 1 roll $2.30
- **Bailing Twine (recycled)**

**Sub total** $577.86

### Top Vent Door Material

- **8’ 2x4 lumber ($2.47/ea)**
  - 8 ea $19.76
- **10’ 2x4 lumber ($3.08/Ea)**
  - 4 ea $12.32
- **Hinges ($5.00/ea)**
  - 8 ea $40.00
- **Gate latch 6” ($3.45/ea)**
  - 2 ea $6.90
- **Bolt latch 4” ($7.75/ea)**
  - 4 ea $31.00
- **Duct Tape**
  - 1 roll $4.00

**Sub total** $113.98

### Total materials for hoop house

$691.84

- Cost of materials will vary according to length of hoop house, location and vendors. Material for end walls and doors will remain the same.
Table 3. Cutting instructions for 2x4 boards to construct one endwall.

<table>
<thead>
<tr>
<th>Length</th>
<th>Length</th>
<th>Part#</th>
<th>Length</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16'</td>
<td>un-cut</td>
<td>“A”</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10'</td>
<td>5'</td>
<td>“C”</td>
<td>4’ - 6”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4’ - 6”</td>
<td>“L”</td>
<td>(2) 2 ’- 6”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8’</td>
<td>(2) 4’</td>
<td>“F”,</td>
<td>(2) 3’ - 10”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“G”</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8’</td>
<td>(2) 6’- 5½”</td>
<td>“B”,</td>
<td></td>
</tr>
</tbody>
</table>

Lumber must be cut according to cutting instructions
End wall dimensions & part names

Hoop strap location

Door corner

3'-7 3/16" 47° 43°

Hip

3'-3 3/16"

4'-3 3/16"

2'-10½"

6'-5 1/2"

2'-6"

4'

1' Gap from edge of hole to outside edge of support board

1 1/4" Hole

15' 6" 5'

16'
Table 5. Cutting instructions for 2x4 boards to construct a top-venting door.

<table>
<thead>
<tr>
<th>#</th>
<th>Length</th>
<th>Cut length</th>
<th>Part #</th>
<th>Cut length</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>8'</td>
<td>(2) 6' - 3&quot;</td>
<td>“AA”,</td>
<td>(2) 1' - 6&quot;</td>
<td>“HH”,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“CC”,</td>
<td></td>
<td>“KK”</td>
</tr>
<tr>
<td>1</td>
<td>8'</td>
<td>4’ - 8”</td>
<td>“BB”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8’</td>
<td>Un-cut</td>
<td>“FF”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10’</td>
<td>(2) 4’ - 8”</td>
<td>“DD”,</td>
<td>(2) 4’-4½”</td>
<td>“GG”,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>“EE”</td>
<td></td>
<td>“JJ”</td>
</tr>
</tbody>
</table>

IMPORTANT: Must follow cutting instructions in order to maximize lumber material.
Top-venting door dimensions & part names

Hinge Placement

pieces (hh) and (kk)
PVC Pipe assembly

• Cut 28” pieces of PVC for each hoop you will need for your hoop house. Assemble the 22’ arches by gluing the 28” piece into the bell end of the 20’ PVC using PVC cement.

• Apply latex paint to plastic side of each PVC hoop
Rebar requirements & placement

• Two 24” x ½” rebar will be needed for anchoring each end wall and each hoop.
• Drive each rebar piece into the ground 18” at three foot intervals along each side using twine Stretched from corner to corner on each side as a guide.
• PVC will slide over rebar anchor and into 1-1/4” hole on end wall.
PVC hoops are spaced 3 feet apart
Vented hoop house door – “T” post attachments
Corners need to be taped to keep edges from tearing plastic
Purlin hangers or cross connectors
short “T” for connecting purlin to end hoop
Using twine to tie down plastic
stretching plastic and attaching to end wall door frame with 4 ft lathe
Support posts for snow load

• Measure distance from purlin to the ground
• Using 2”x4” lumber notch one end of the board
• Place notched end on purlin and attach with twine or any kind of strap
Adding Supports for Snow Load

• Measure distance between purlin and floor
• Cut 2 x 4 board to that length
• Notch out a “V” on one end of the board
• Place notched end under purlin, other end on ground
• Secure purlin to board with twine or plumbers tape
Conclusion

• A hoop house is a practical tool that is affordable to construct, practical to use and will extend the growing season by planting earlier in the spring and later in the summer and early fall. Some plants can be grown year around.

• With these structures one can make farming of food crops affordable, profitable and fun all year around.
Contact Information

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