Mid-Winter Production: Deep Winter Greenhouse
Brooke Knisley, Alternative Roots Farm
Air circulation schematic

8" dia. black metal stove pipe or 8" dia. ABS pipe open at ends for hot air intake.

4" diameter perforated ABS drain tile as exhaust manifold

8" inline variable-speed centrifugal duct fan

8" dia. double-wall smooth interior perforated drain tile with appropriate tee connectors and end caps.

1.5" washed river rock thermal mass with compacted soil or concrete topping.

<table>
<thead>
<tr>
<th>Function</th>
<th>Item</th>
<th>Unit</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass ducting:</td>
<td>Perforated drain tile (Provasco OBGF20MP)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>duct tees (Provasco GF008)</td>
<td></td>
<td>3</td>
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<tr>
<td></td>
<td>end caps (Provasco C033-G1)</td>
<td>8&quot;</td>
<td>4</td>
</tr>
<tr>
<td>Intake ducting:</td>
<td>Metal stove pipe</td>
<td>8&quot; x 5&quot;</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>stove pipe tee</td>
<td>8&quot;</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>stove pipe elbow</td>
<td>8&quot;</td>
<td>1</td>
</tr>
<tr>
<td>Thermal mass:</td>
<td>1.5&quot; washed river rock</td>
<td>yds</td>
<td>~48</td>
</tr>
</tbody>
</table>
~0.25 lb/3’ gutter---varies
~5 weeks until harvest
2-4 cuttings per gutter
Main crops change each season
2nd Best seller
0.25-0.33/10 row tray
2-2.5 weeks to first true leaf
Best seller
0.5-0.6/open shallow tray
10 days–2.5 weeks to harvest (3-4” ideal)
Third best seller
Keep in Touch:

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Alternative Roots Farm - Facebook  alt.roots.farm on Instagram
Resources:

Deep Winter Greenhouses page, University of Minnesota Extension
https://extension.umn.edu/growing-systems/deep-winter-greenhouses
-design and construction (DWG 3.0 design coming out this year)
-growing/production resources
-photos
-enterprise analysis

The Northlands Winter Greenhouse Manual
A Unique Low-Tech Solution to Vegetable Production in Cold Climates
Carol Ford & Chuck Waibel

Facebook Groups
Deep Winter Producers Association Group:
https://www.facebook.com/groups/845092875544652/