SP291-N-Raised Bed Gardening

The University of Tennessee Agricultural Extension Service

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Vegetables

Raised Bed Gardening

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Plant and Soil Science

Advantages

Raised bed gardening offers gardeners the opportunity to increase production while decreasing garden area. Raised beds are especially helpful to gardeners with limited gardening space and those who have difficulty with fine-textured, clayey soils which do not dry early. Efforts to improve undesirable soils can be concentrated on growing areas only.

Raised beds drain and warm up earlier in the spring, which allows planting of cool season vegetables at recommended planting dates. Raised bed gardens can be entered soon after rains or irrigation without compacting soils. Water will penetrate better during heavy rains and there will be less danger of erosion.

Once they are built, raised beds are easy to prepare for planting and to care for throughout the growing season. Root crops grow longer and straighter in medium- to coarse-textured soils. Raised beds are well suited to a wide range of intensive gardening techniques such as row covers, trickle irrigation, intercropping, successive plantings, use of plant supports, compact varieties and mixtures of food and ornamental plantings. Their orderliness usually produces an extremely attractive and appealing appearance.

Disadvantages

Raised beds also have a few disadvantages. They make it difficult or impossible to use large, mechanical equipment. Their edges break down unless they are supported. They require time, labor and perhaps money to develop. They are not well suited to sprawling vegetables such as pumpkins and winter squash. The close spacings used in raised beds can promote plant diseases by reducing air circulation and allowing plants to remain moist longer. The most severe problem associated with raised beds, however, is drainage.

Rapid drainage is an advantage when a gardener is trying to plant early spring vegetables. It is a disadvantage during the summer when drought stress can quickly lead to reduced yield and quality and increased physiological disease such as blossom-end-rot. Sandy soils and very high beds are particularly susceptible to drying out. Use low beds and add organic matter to them to help retain moisture.

Apply mulches to the surface of the beds. Supplemental irrigation should also be considered essential when gardening on raised beds.
Developing Raised Beds

The simplest raised beds are temporary. They may be formed by raking or plowing freshly worked soil into ridges and away from aisles where one walks. Four- or 5-foot wide beds with 1 or 2 feet between beds are appropriate. Be sure that you can reach half way across each bed from one side to plant, weed and harvest. Make raised beds 4 to 8 inches high and any convenient length. Raised beds should never be walked on once they are formed. The absence of soil compaction in raised beds is one of their strongest advantages. Compost worked into the soil annually reduces soil crusting and enhances seedling emergence.

Flatten the top of temporary raised beds with a rake and they are ready to plant. Fertilizer, lime and organic matter are applied to the entire garden area before temporary raised beds are formed. These beds break down over the gardening season and must be reformed each year. Gardening with temporary raised beds is really not very different from traditional gardening. Formation of temporary raised beds is illustrated in figure 1.

A combination of soil from the aisles, top soil, compost, sand, shredded leaves and other material may be added to fill the raised bed to the desired height.

Some gardeners form permanently raised beds using a system known as double digging. Double digging (figure 2) is a lot more work than the above system but assures that the raised bed will contain soft, enriched soil to a depth of nearly 2 feet.

Permanent raised beds make much better use of the advantages of raised beds. Begin to form permanently raised beds by marking off the desired area with stakes and twine. Fertilizer, lime and cover the enclosed area with compost, shredded leaves or other organic material as desired. Work this material into the soil as deeply as possible using a spading fork or rototiller. Next, edge the beds. Raised beds may be edged with old lumber, landscape timbers, railroad ties, concrete blocks or whatever is convenient.

Begin the double digging process by marking off the boundaries of the raised bed as described before. Use a spading fork to work the bed. Dig a trench 1 or 2 feet wide and one fork length deep across the end of the bed. Remove this soil to the far end of the bed. Apply fertilizer, lime and organic material to the trench. Using the
spading fork, loosen the soil in the bottom of the 
trench to the depth of the fork tines and work in 
the fertilizer, lime and organic material.

Now step back and dig another trench, 
placing the loosened soil on top of your previous 
trench. Again add what you wish, loosen the soil 
in the bottom of this trench and mix in the materi-
als you have added. Continue to the end of the 
bed. Fill in the last trench with soil removed from 
the first trench. Edge the bed with the desired 
materials. The loosened soil will be several inches 
higher than the adjoining aisles. This double 
digging process is illustrated in figure 2. Never 
step in a raised bed after it has been double dug. 
The soil will settle gradually and beds will not 
need to be redug for one or even several years.

**Using Raised Beds**

Raised beds will have maximum efficiency if 
plants are spaced equidistant from each other 
rather than in rows. Plants should ideally just 
touch, forming a canopy over the soil when they 
are mature. One way to accomplish this spacing is 
to set plants a little farther apart than suggested 
spacings in the row and use the same distance 
between rows.

It may be more practical to plant two or 
three rows of vegetables such as bush beans 
parallel to the bed length without worrying about 
equidistant spacings. Small vegetables that tend 
to mature all at once or that are used only in 
small amounts may be planted in short rows 
across the bed. Several plantings two or three 
weeks apart will maintain uniform production 
over many weeks.

Vegetables such as tomatoes and cucum-
bbers do well in raised beds if they are supported 
and allowed to grow up rather than to sprawl. 
Corn is not well adapted to raised beds as it needs 
to be well anchored. Large sprawling vegetables 
such as watermelons and pumpkins are also 
better suited to traditional gardening systems than 
raised beds.

Small vegetables such as radish and lettuce 
may also be interplanted between tomatoes and 
other large vegetables. They will mature and can 
be removed before the tomatoes need the space. 
Reversing this procedure, peppers can be inter-
planted between lettuce plants in the same way.

To use raised beds efficiently, they should 
be well fertilized, watered and kept filled with 
growing plants. When a spring vegetable is 
harvested, plant a summer vegetable in its place. 
Follow summer vegetables with fall vegetables. 
Recommended spacings for common vegetables in 
raised beds are given in Table 1.

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Inches Between Plant Centers</th>
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</thead>
<tbody>
<tr>
<td>beans, bush</td>
<td>4-6</td>
</tr>
<tr>
<td>beets</td>
<td>2-6</td>
</tr>
<tr>
<td>broccoli</td>
<td>10-15</td>
</tr>
<tr>
<td>cabbage</td>
<td>15-18</td>
</tr>
<tr>
<td>carrots</td>
<td>2-4</td>
</tr>
<tr>
<td>cauliflower</td>
<td>15-18</td>
</tr>
<tr>
<td>collards</td>
<td>8-15</td>
</tr>
<tr>
<td>eggplant</td>
<td>18-24</td>
</tr>
<tr>
<td>kale</td>
<td>8-15</td>
</tr>
<tr>
<td>kohlrabi</td>
<td>5-8</td>
</tr>
<tr>
<td>lettuce, leaf</td>
<td>6-10</td>
</tr>
<tr>
<td>okra</td>
<td>10-18</td>
</tr>
<tr>
<td>onions</td>
<td>3-5</td>
</tr>
<tr>
<td>potato, Irish</td>
<td>9-12</td>
</tr>
<tr>
<td>potato, Sweet</td>
<td>18-24</td>
</tr>
<tr>
<td>radish</td>
<td>2-4</td>
</tr>
<tr>
<td>spinach</td>
<td>4-6</td>
</tr>
<tr>
<td>squash, summer</td>
<td>18-24</td>
</tr>
<tr>
<td>Swiss chard</td>
<td>6-10</td>
</tr>
<tr>
<td>tomato</td>
<td>18-24</td>
</tr>
<tr>
<td>turnips</td>
<td>4-6</td>
</tr>
</tbody>
</table>

* Gardeners new to raised bed gardening should use the wider spacings. More experienced raised bed gardeners can 
  use the closer spacings.