

Raised Bed Gardening

Gardening in raised beds has been a common practice for centuries. "Raised" means the soil level in the bed is higher than its surroundings, and "bed" implies a size small enough to work from the surrounding walkways.

Advantages

- Better drainage: You can put low, wet areas into productive use.
- Warmer soil: You can plant earlier, and plants will grow faster and yield more.
- Defined beds: You can walk on paths along the beds, therefore minimizing soil compaction; compacted soil inhibits movement of air, water, and roots which can reduce crop yields up to 50 percent.
- Higher production: Increases the yield per square foot over traditional gardens, partly by higher density planting, partly through intensive improvement of soil.
- Easier pest control: You can place chicken wire or hardware cloth under raised beds to protect crops from moles and gophers. Attaching low fences to framed beds discourages rabbits.
- Walkways of sod, mulch, stone or brick around the beds provide mud-free access year-round.
- Conserves water: Small beds are ideal for a watering system, such as drip, that disperses water where it is needed and not on foliage. Wet foliage can promote disease.

Raised Bed Basics

- Height and materials: You can mound 6 inches of soil without a frame; deeper beds need a frame to stay intact. Rot-resistant lumber, cinder blocks, bricks, or rock layers can make a frame. Beds taller than 18 inches may require the use of crushed rock, pea gravel, sand, or drainage tiles in the bottom to ensure good water drainage. Consider elevating the bed 2 feet or more to lessen stress on the lower back or to provide access from a wheelchair.
- Guidelines: Keep the beds narrow; match their length to the site and to the gardener's needs; and place them near your watering system. You will want to reach everything in the bed without stepping into it, so make beds about 2 feet wide if accessible from only one side and about 4 feet wide if accessible from both sides. For beds wider than 4 feet, use planks or stepping stones for access paths to reduce soil compaction.
- Orientation: A north-south orientation is best for low-growing crops, allowing direct sunlight to both sides of the bed. Beds that contain taller crops such as pole beans, trellised peas, or caged tomatoes might do better on an east-west axis. Thus, lower-growing crops could be planted on the south side of the bed and not be shaded by taller plants growing alongside.
- Attachments: The raised-bed frame can support poles, low fences, trellises, seating, or even a temporary cold frame. Imagine being able to start plants in the ground early, under covers, without the need to transplant them!

Safety Issues Concerning Some Materials

- Pressure-treated lumber, synthetic wood (recycled plastic), vinyl fencing; naturally rot-resistant woods (cedar and redwood), stone, concrete block, and brick are potential choices for a raised bed. Cement block will leach lime into the soil over time; creosote or pentachlorophenol-treated lumber can leach out and injure plants.
- CCA-treated (Chromated copper arsenate) lumber was phased out of consumer/residential products as of December 31, 2003. The Environmental Protection Agency (EPA) does not require replacing existing CCA-

treated structures but suggests sealing them annually with an oil-based stain. Also, Pennsylvania State University research found heavy plastic liners eliminate contact with soil.

- For use in garden structures, the EPA approved alkaline copper quaternary (ACQ) which is arsenic-free but higher in copper.

Soil Basics

- **Timing:** Work the soil in the spring only when a handful of soil squeezed in the palm yields no more than a few drops of water. Do not rush this step!
- **Amendment:** For both unframed and framed raised beds, the soil needs to be a light, well-drained growing medium. Add organic matter (composted is best) like sawdust, animal manures, ground bark, leaves, or pruning materials. Alternately, use commercial planting mixes, vermiculite, or perlite. Keep at least one third of the volume of the bed's root zone in native soil, even if it is heavy clay, as this retains valuable soil nutrients.
- **Fertilizer:** Vegetables need added fertilizer to perform well in a short season. Add organic fertilizer 2 to 3 months before planting; synthetic fertilizer can be worked into the soil at time of planting and during the growing season. Follow instructions for the type of vegetable and fertilizer. If you use a planting mix with added manure or a synthetic fertilizer, you may not need additional fertilizer. Nitrogen is essential for plant growth and for breaking down organic matter into a form useful to plants.
- **Maintenance:** Add organic material at least annually. Covering beds for winter with 2 inches of organic material (compost, leaves, manure, etc.) suppresses weeds.

Step-By-Step Soil Preparation

Unframed Bed

1. Spread a 2- to 3-inch layer of organic material over the soil; composted material is best. Rototill or spade the top 6 inches of soil to mix in the organic matter.
2. Use a shovel and rake to shape beds about 4 feet wide. Shovel the walkway areas (14 to 16 inches wide) to a depth of 6 inches; add the excavated soil to the adjoining bed. Now your beds should have about 9 inches of organic-soil mix (6 inches of tilled soil, some soil from the path plus 2 to 3 inches of organic material), sufficient for the roots of most vegetables.
3. Rake the elevated area. You will end up with a bed that is about 3 feet wide on the top and sloping to 4 feet wide at ground level.
4. Walk only in the pathways. Stake the four corners of each bed to prevent hose damage to beds and plants.
5. Repeat steps 1 and 2 above for a few years to incorporate more organic matter.

Framed Bed

1. If the soil is heavy clay, rototill before building a raised bed.
2. Once the bed is constructed, fill it with alternating 2- to 3-inch layers of native soil and organic matter, mixing with a spade as each layer is added. Or mix soil and organics in a wheelbarrow first, and then fill the bed. Retain at least one-third native soil in the mix; native soil is a good source of nutrients.
3. Rake the soil level, and you are ready to plant.

Watering

Keeping the soil moisture even gives the best result in growing vegetables. The mixture of soil and organic matter in a raised bed dries faster but also absorbs water faster than clay soil, so be vigilant with watering. Soaker hoses, perforated plastic sprinkler hoses, and drip-type irrigation all work well in a raised bed.

OSU Extension Service resources @ <http://extension.oregonstate.edu/gardening>