Raised Bed Gardening

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Raised bed gardens have been in use for centuries. Permanent beds, raised a few inches above the soil level and arranged just wide enough to reach across by hand, are an ideal way to grow vegetables and small fruit. Several rows of vegetables can be grouped together in a bed with a permanent walkway on either side. Soil in which plants are grown is never walked on and thus free of compaction.

The idea of growing plants in single file, "row crops," started when the horse and plow needed space between rows to cultivate crops on a large scale. Later, row spacings were 24 to 36 inches apart to accommodate tractors and their implements. Out of habit, many home gardeners plan single row vegetable gardens; however, foot traffic on each side of a single row can severely compact soil by the end of a growing season.

Raised bed gardens can range from a simple rectangular plateau of soil to a more elaborate bed framed in wood or stone and mortar. Although more expensive and time consuming to build, permanent structures will keep soil in place during heavy rains and will stay neater looking in the landscape. However, for a large garden, several beds of mounded soil are very adequate to achieve desired results. Just make sure that plenty of mulch is used over soil to hold it in place during drenching rains.

Benefits of Wide, Raised Beds

Higher Yields. More square feet of garden space is used to grow plants and less is used for pathways. Due to wide rows, individual plant yields may be slightly less but more plants can be grown in a given space.

Better Soil. Amendments such as compost and fertilizer are only spread on beds and not wasted on pathways. Soil can have higher organic matter levels, remain untrodden — and thus remain uncompacted and better drained.

Decreased Water Use. Plants grown close together shade the soil, decrease evaporation and keep roots cooler. Water is only provided to the beds and not to the pathways.

Fewer Weeds. High-plant population in the bed keeps weeds crowded out. Pathways can be covered in landscape fabric or mulch to choke out weeds. The need to frequently rototill the garden can be eliminated.

Extended Season. Soil in raised beds can be worked earlier in the season and warms up earlier than traditional gardens. Rainy weather is less of a hindrance to getting into the garden.

Better Pest Control. Raised bed gardens are easy to cover with insect screening fabric. Crops are easy to rotate from bed to bed — preventing a buildup of pests. Plants are healthier and more resistant to insect and disease attack.

Raised Bed Dimensions

A rectangular bed of soil 3 feet across and 25 feet long provides 75 square feet of space to grow vegetables. This dimension is practical for figuring fertilizer rates and spacings of transplants. Vegetables can easily be tended from either side of the bed.

If more growing space is required, several beds of identical dimension are easier to manage than a longer single bed. In fact, several separate beds in the garden will make crop rotation and pest control easier.

Height of the bed can vary greatly. A 6 inch increase in height above the existing soil grade will greatly enhance drainage. However, beds can be constructed as high as 18 to 24 inches to accommodate less agile or physically limited people.

Planning the Layout of Raised Beds

For best light exposure, plan to build beds in a north to south orientation. Paths between beds can be as narrow as one foot wide. However, make them wide enough to comfortably walk, stoop and haul vegetables. Make a rough sketch of backyard dimensions before staking out the gardens. If space is limited, make a scale sketch on graph paper. Out of a separate piece of paper cut rectangles the size of the proposed beds and arrange them on the sketch to fit in the most efficient manner.

Make a list of crops to be grown. Many gardeners like to work their vegetable plantings into the landscape. Beds do not have to be located in a rank and file array. They can be located around the perimeter of the yard to allow space for play areas or entertaining.

The final step in planning is to stake out the beds and walk through them to make sure it is a workable arrangement before expending needless labor.

Building a Raised Bed Garden

To make a raised bed, the following tools will be needed: shovel, garden spade, spading fork, rake, string, four stakes and a tape measure.

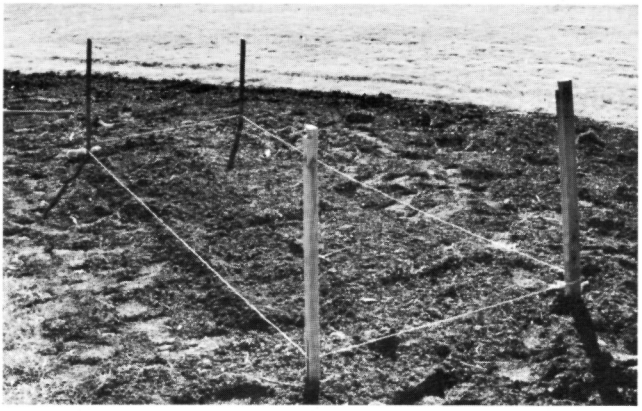
Before staking and stringing an area, eliminate all weeds and turf. Bermudagrass lawns will have to be smothered with

black plastic for several weeks first or killed back to the roots with a glyphosate-containing herbicide. Either method must be done when grass is actively growing. Late summer is the best time to do this, since high temperatures will make either method more effective.

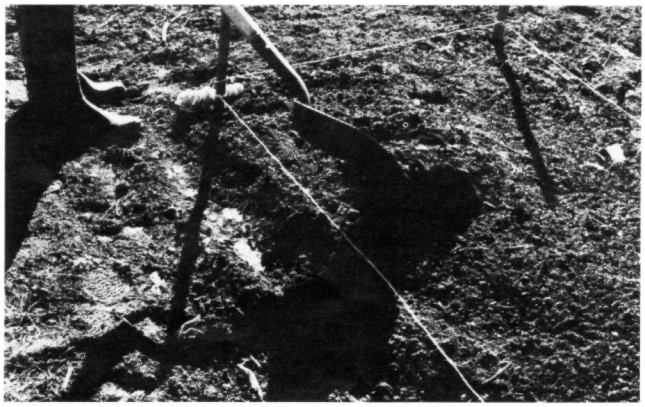
Outline four corners of the bed with stakes and stretch twine tight. If making a simple mound-type bed, dig around the edge of the twine with a sharp spade. This will neatly define the edge of the bed and make a furrow for drainage. Use a steel rake to pull soil up around the edges of the bed. Use the back side of the rake to flatten out the top. A hiller-furrower attachment on the rototiller can also shape beds as just described (see Figure 1).

Beds can be initially cultivated with a rototiller, then finished with hand tools. Beds adjacent to a bermudagrass lawn will need a barrier in place, or grass will invade the bed within one month after construction. A barrier of metal roof flashing or other material should be buried one foot deep and extend 3 to 4 inches above the soil line to keep grass out. As with any vegetable garden, the perimeter area must be kept weed and grass free to keep beds clean.

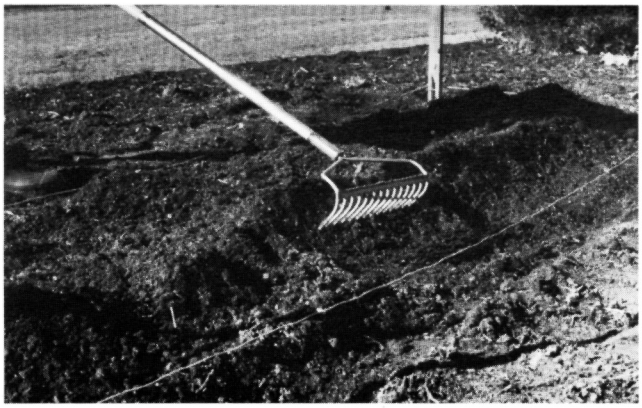
Double digging beds can be very beneficial, especially in tight clay soils. Spade the loose, top layer of soil to one side of the bed. Use a spading fork to pierce and loosen deeper soil layers before returning the top layer to its place. This allows for greater aeration and water penetration (see Figure 2).



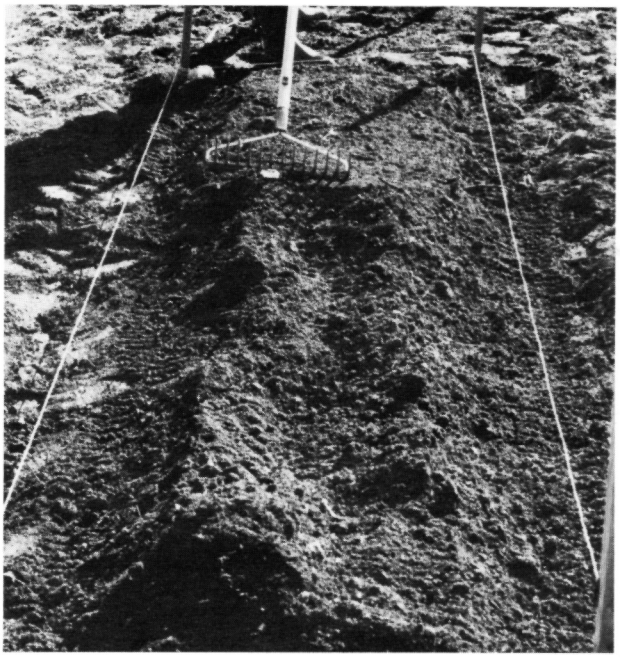
A. Outline Bed.



B. Dig Around Edge of Bed.



C. Pull Soil Up Around Edges of Bed.



D. Flatten Surface of Bed.

E. A Hiller-Furrower Rototiller Attachment Can Also Shape Beds.

Figure 1. Bed Preparation

While turning soil, work plenty of organic materials into the bed. Compost, rotted grass clippings, manure, etc., will all help make soil more friable while increasing its water and nutrient retention capacity. Be sure to remove any clumps of weedy grasses and rocks while working the soil.

Some soils are not suitable for gardening. A good sandy loam soil may need to be added to fill beds.

Oklahoma's high temperatures rapidly decompose organic matter. Plan to add a two inch layer of compost or other organic materials every spring and fall. This should replenish the organic matter needed in Oklahoma's mineral soils.

When the bed is finished, leave stakes in place to guide water hoses around corners. Old pieces of pipe slipped over stakes will help garden hoses roll around the corners.

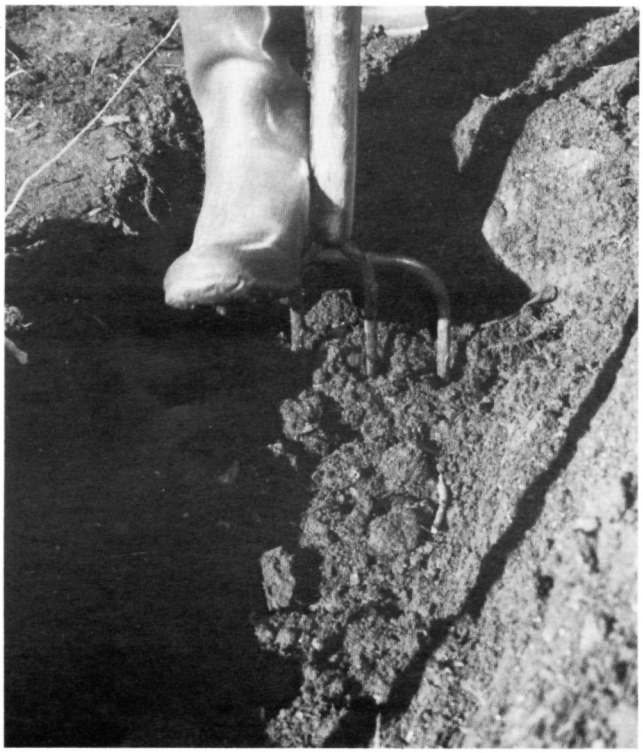
If constructing a wooden or stone framed bed, level the area, make the basic frame, then prepare the soil in the bed, adding additional soil from pathways. Additional soil and compost materials may need to be added to fill it to the top. A raised bed filled with alternating layers of compost and soil will make an ideal environment for plant growth.

Framed-in beds can be made with treated lumber, treated landscape timbers, concrete blocks, rock or bricks. Use of railroad ties is not recommended, unless they are well aged — creosote vapors can burn tender plants. The chemicals used in treated lumber are considered toxic. Use caution when sawing or drilling and use protective clothing like dust masks and unlined rubber gloves when working with treated lumber. Avoid breathing sawdust. These materials are not known to readily leach into soil; however, it is best not to grow root crops that may grow in direct contact with the wood. Some gardeners line beds with landscape fabric as a safeguard. If cost is no object, heart cedar or redwood can be used but will still rot more quickly than treated lumber when in contact with soil.

Soil will expand and contract when freezing and thawing. Wood can easily "bow-out" and masonry may crack. Reinforcing rods used in all of these materials will help give structural stability (see Figure 3 for a simple landscape timber bed held together with reinforcing rods).

To make raised beds useable throughout the year, consider using flexible black plastic pipe or No. 9 gauge wire hoops down the length of the row and stretching plastic over them to extend the season. The plastic can be secured along the edges using bricks or boards. To create ventilation, use slitted plastic or have two edges meet over the top and secure them with clothespins. These can be opened on warm and sunny days (see Figure 4).

A. Spade Top Soil



B. Spading Fork Loosens Deeper Soil Layers.

Figure 2. Double Digging.

A. Overlap Timbers.

B. Reinforcing Rods Hold Timbers Together.

Figure 3. Simple Landscaped Timber Raised Bed.

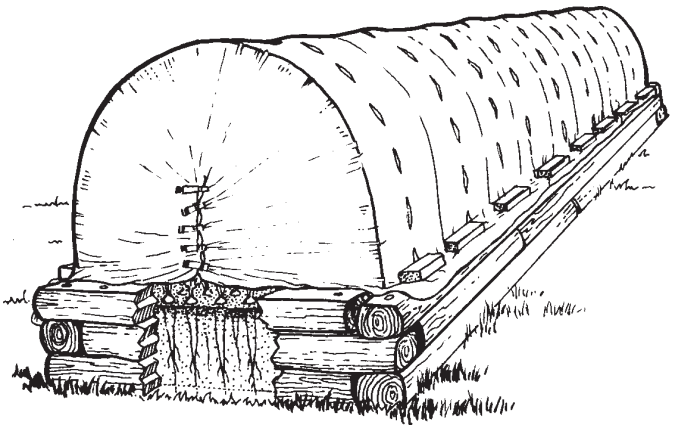


Figure 4. Raised Bed Garden Row Cover.

Gardening with Raised Beds

Plantings can be alternated in a zig-zag pattern down the row to fit more plants into the bed. Intercropping fast-maturing plants with longer-season crops will optimize the use of space.

Although more plants shade the soil and reduce evaporation, the higher plant population may need more water. Unframed raised beds can lose moisture along the side unless they are heavily mulched. They do have the advantage of warming up more quickly than flat soil surfaces in the cooler seasons.

Overhead sprinklers that broadcast water will also water the rows in-between and encourage weed growth. It is better to use drip irrigation or a soaker hose in each bed. Small gardens can be easily hand-watered using a hose wand that has a sprinkler head to keep droplets small.

The great advantage to raised beds is that only the soil where plants will grow needs to be fertilized. None is wasted on pathways. Take a soil test first. Fall is the best time. If soil pH needs adjusting or slow-acting materials such as phosphorus or potassium need to be added, they can be worked into the soil before the rush of spring planting.

Plants in raised beds are more crowded and nutrients can be depleted in a shorter time than in conventional gardens. Be sure to sidedress heavy feeders such as onions, tomatoes and cole crops before they flower or begin bearing.

Many gardeners who know the value of crop rotation and maintenance of soil fertility will rotate 25 percent of their bed space into cover crop each year. Use of cool season legumes such as hairy vetch or Austrian winter peas help replenish organic matter to beds each winter. In the summer, use buckwheat or cowpeas in beds that are in rotation.

In crowded, raised bed plantings, insects and diseases can build up quickly. A brief walk through the garden each day to check for signs of infestation can help stop a problem before it gets serious. Keep dense-growing plants, such as tomatoes, trained up off the ground. Pinch off their first two suckers to allow for air movement around the base of the plant. Check undersides of leaves for insect eggs and destroy them before they hatch. Be sure to rotate vegetables from within like families to avoid a buildup of pests in the soil. For example, tomatoes, peppers and eggplants should all be moved to a new location each year because they are related and share the same problems. For further details on insect identification and control, see Extension Fact Sheet EPP-7313, Home Garden Insect Control.

Selecting Vegetables for Raised Beds

No special varieties are needed for raised bed gardens; however, the more compact types will leave room for a larger harvest. Sprawling plants, such as melons and cucumbers, will need plenty of space. Train them up on wire or string trellises or select bush-types. Just remember that yields on bush-type plants will be lower.

Very tall plants, such as corn or okra, can also be grown in raised beds. Plant them on the north side of the garden so they will not shade other vegetables. Corn is a heavy nitrogen feeder. Plan to follow this crop with a nitrogen-rich legume, like snap beans, to make up for any extreme deficiencies.

Pole beans grow well in raised beds and can be intercropped with faster, shorter growing plants such as lettuce, radishes and Chinese cabbage. Bush beans can be grown in a double-wide row for maximum production.

Tomatoes will need to be staked or caged. Choose disease-resistant varieties to reduce the need for spraying (see Extension Fact Sheet HLA-6012, Growing Tomatoes in the Home Garden).

Perennial crops such as asparagus, rhubarb, horseradish and some herbs should be planted in a separate garden. A few short-term annual vegetables can be tucked in among perennials while they are getting established.

Small fruit crops such as strawberries, blueberries, blackberries and raspberries are ideally suited to raised beds.

To plan spacing and planting dates for vegetables, check Extension Fact Sheet HLA-6004, Oklahoma Garden Planning Guide. With a raised bed garden, plants do not need space between rows for maintenance. So, ignore any references on “between row” spacing. For example, if the Fact Sheet, or the back of a seed packet, recommends seeding beans four inches apart within the row and one and one-half feet apart between the rows, simply sow beans four inches apart in any direction in the raised bed.

Initial preparation of a raised bed can take many hours and hard work; however, in later years simply turning over the top few inches and planting will be much easier than rototilling and “re-creating” a large traditional garden every spring. The rewards for this labor will also come with healthier, more productive crops and less time spent weeding, leaving more time to enjoy planting and harvesting.

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