EXTENSION
College of Agriculture,
Biotechnology & Natural Resources

FS 10-33

RAISED BEDS CAN MAKE GARDENING EASIER

Angela O'Callaghan, Area Extension Specialist, Social Horticulture

Southern Area

Introduction

In places where soils are difficult to work, or are generally infertile, gardening in raised beds can solve a number of problems. Growing plants in a raised bed allows a gardener to control the type and fertility of the soil or mix, which improves the likelihood that plants will thrive and produce higher yields (Fig. 1).

Because a raised bed has a smaller area to be kept moist, gardening in one can limit water waste. In addition, the bed can be raised to a level that is most comfortable for the gardener. No matter what environment, raised beds can be useful.

Figure 1. *A raised bed permits a gardener to grow plants that might otherwise struggle to survive.*

What is a raised bed?

Many kinds of planting beds can be considered "raised." It can be as simple as an area where enough amendments have been added so that the level is higher than the surrounding soil. In this case, there may or may not be walls built to confine the improved soil. More often, however, the term is used to describe a discrete area that is walled and considerably higher than the surrounding ground. The height depends on what is being grown and what the gardener needs. It is filled with material that could be completely different from the original soil – usually a mix with a high level of rich compost added to other components. In some ways, a raised bed could even be a particularly large plant pot (Fig. 2).

Figure 2. *This half whiskey barrel is either a very small raised bed or a very large planting pot.*

Why build one?

When bending and reaching are difficult, a raised bed can be at a height that is more comfortable for the gardener. It can be helpful in areas where garden soil is difficult to work because it is a heavy clay or very rocky. Plants often die when they are growing in soil that drains poorly, so raised beds should contain well draining soil or mix. Vining vegetables, or plants such as mint that might have a tendency to become invasive, can be better managed when they are grown in a limited area.

What plants benefit?

Vegetables are often grown in raised beds, but they can provide a good setting for many plants, including flowers and small shrubs. A raised bed is really a mini-environment that is designed for the plants growing in it.

Virtually any plant can benefit when local conditions do not meet the needs of the desired plants. Many people, for instance, want to grow fresh vegetables. These plants evolved in places where soils were mildly acidic or neutral, and relatively fertile. Neither of these conditions is dominant in the desert Southwest where soils tend to be alkaline and infertile. The raised bed can provide a setting that replicates those plants' native environment more closely.

Where to place it?

A sunny location is usually best. If possible, choose a site that is brightest in the morning and noon time. Because soil drainage is possibly the single most important factor in plant success after light, a raised bed should be placed atop an area where water can drain readily without damaging the surface beneath it. Since it will contain growing plants, it should be located where there is easy access to water. If high winds pose a problem, it should be in a sheltered location.

Sizes

The size of the raised bed will depend on the gardener. How much space is available? If a bed is built so one could walk around it, then it should be about 4 feet wide, providing an easy reach of 2 feet from either side. If it is built next to a wall, the width should be less, to reduce the possibility that someone will need to walk on the bed itself. Many people opt for 8- or 10-foot-long beds, although that is by no means critical. The length is less of a concern, and can be as long as is practical (Fig. 3). Remember, getting to the other side means having to walk around it.

Figure 3. *People often find that a bed is most welcoming when the cap of the walls is wide enough to be a seat.*

The height can vary, depending on the crops being grown and the gardener's own needs. The bed's depth is important for several reasons. For deep-rooted crops, such as tomatoes and melons, a deeper bed (almost 2 feet deep) will be necessary.

Figure 4. *Even a shallow bed can be productive it if has fertile fill and good drainage*

Lettuce and green leafy vegetables can grow well in a bed as shallow as 1 foot or less (Fig. 4). To maintain good form for root crops such as carrots, which might be 8 inches long, the bed must be at least a couple of inches longer than the longest carrot.

In every case, drainage is critical. Standing water at the bottom of the planter results in a muddy, airless area where roots cannot work and will ultimately die. Good drainage is a function of the depth of the bed, the growing medium and where it is built.

Building materials

The choice of materials for a raised bed is really up to the gardener. The walls must withstand the pressure of both the growing medium and the weight of the water that soaks it, not to mention the plants growing within them. There are many choices for the raised bed walls, and the selection depends on the gardener's aesthetics and budget. Boards made of wood or composite materials, bricks, blocks, or plastic can be used. Any of them can hold soil or planter mix, and can be attractive. Each kind of material has benefits and drawbacks.

Figure 5. *Many kinds of wood can be used if they are not treated with toxic compounds.*

Wood is attractive, but certain lumber varieties or wider boards can be costly. If using wood, take care not to use wood that has been treated with anything that might be taken up by the plants (Fig. 5). At one time, wood was "pressure treated" with arsenic compounds, but that practice has been largely discontinued. In some parts of the world, when wood gets wet it has a tendency to mold and rot. In dry areas (less than ~ 12 inches of annual rainfall), this is less of a problem.

Plastic and aggregate materials vary greatly in their strength. With either wood or plastic, longer boards need extra support. If they are used for high (more than 2 feet) walls, they may bend or buckle under the weight of the planting material. In addition, plastics tend to be less durable under hot, dry desert conditions (Fig. 6).

Figure 6. *Plastic can look like other materials, but may not be durable in a desert climate.*

Blocks come in a wide variety of styles and can be decorative or simply be construction blocks. Decorative blocks are usually expensive (Fig. 7); construction blocks (Fig. 8, 9) are often high in salts that must be leached if plants are to survive. Because their weight stabilizes them, block raised beds may not need mortar.

Figure 7. *They can be expensive, but decorative blocks make elegant raised beds.*

Figure 8. *The appearance of a block raised bed can be improved with a simple coat of paint or other decorative coating.*

Figure 9. *A small bed can be made of bricks without mortar if it is not going to be permanent.*

Fill materials

Usually raised beds are filled with a mix that is lighter and more fertile than standard garden soil. It is unlikely to be as fertile as the "potting mix" that comes in bags. There are many types of planter mix, which is usually a coarse material that is rich in compost. Garden or field soil is generally **not** a good choice because of poor fertility and drainage.

Drainage is key to success with any plants. Raised beds need to contain moist growing mix but there must be a way for excess water to drain away.

Watering

As with any other planting area, a raised bed can be watered by hand with a hose or with an automated system. In an area where the weather can be extremely hot and dry, it is probably best to have a system that does not rely exclusively on remembering to hand water. Many kinds of irrigation clocks and controllers are available. Automated irrigation can be as simple as a "leaky hose," a flat rubber hose with regularly spaced holes small enough for water to drip through. Similar to these are "soaker hoses" (Fig. 10) which are composed of recycle rubber. Water drips gradually along the hose length.

Figure 10. *Soaker hoses come in different lengths and can be attached for larger beds.*

Other systems are also available. There are many kinds of drip irrigation, from in-line emitters (Fig. 11) to "spaghetti tubing."

Figure 11. *In-line emitter drip irrigation system*

Tools

One distinct advantage of using raised beds is that they are *raised*. It requires less bending than traditional gardening. Being higher means that smaller tools, such as trowels and hand cultivators, can be used instead of long handled shovels and forks. There is no need for tools designed specifically for raised beds.

Handicapped accessibility

When a gardener has physical requirements that make standard raised beds impractical, a number of options are available.

Figure 12. *Horseshoe beds must be narrow so the gardener can reach all edges*.

It is possible to build a narrower raised bed in the shape of a horseshoe (Fig. 12), allowing a person in a wheelchair to work. Another approach is to build a raised bed that is basically a shallow box on a stand which allows a wheelchair to roll under, permitting the gardener to work comfortably. In any case, it is still important that the box be deep enough for good root development (Fig. 13 a) and b)).

a)

b)

Figure 13. ***a)*** *Handicapped beds may be built in the form of a shelf that a wheelchair can fit under; or* ***b)*** *built low enough that a sitting person can reach.*

Planting

Planting in a raised bed is not different from other gardening. Raised bed gardens can be laid out in traditional rows or in square blocks. Taller plants should be grown so that they will not shade shorter ones. If a bed is laid out in a north-south direction, then it will receive similar light intensity all day, which can improve plant development. In an area with very bright sunlight, shade cloth should be placed over the beds once temperatures have exceeded 85°.

Mulching with straw, chipped wood or other light, dry organic materials helps to

moderate the bed temperature, control water use and limit weeds.

Crop rotation

Insect pests and diseases often do not "jump" from one plant family to another. For this reason, it is best to follow one year's crop with something that is completely unrelated. This really reduces the chance that a disease or insect infestation can get established. If tomatoes were grown in year one, then different plants should be grown there in subsequent years.

The following is only an example; substitute vegetables that you choose.

Year 1: tomatoes (or peppers, or eggplant)

Year 2: green beans

Year 3: broccoli (or cabbage, or collards)

Year 4: spinach (or chard or beets).

After four years, you can begin a similar rotation, as pests will not have had the opportunity to become established.

Maintenance

Gardening in raised beds does not prevent all problems. The fertility of a raised bed needs to be maintained, since plants take up available nutrients over the course of a season. One way to do this is by adding fresh compost to the mix before next season's planting. Incorporating waste such as dried leaves from insect- and disease-free plants into the planter mix can improve fertility.

Plants grown in raised beds tend to have fewer pests, but they are not immune to them. Remove any plant materials that show signs of insect infestation or disease symptoms. As with any other planting area, it is important to clean up a raised bed at the end of each season. If there was a pest problem, it should be dealt with before the next planting.

Soil solarization is one of several pest control methods that does not require chemical pesticides. In this technique, plant material is removed from the bed, the mix is smoothed and moistened; and a layer of clear plastic is placed securely over the surface for several weeks. Temperatures under the plastic become hot enough to kill many insects, weed seeds and disease organisms.

Conclusions

Raised beds can provide gardeners with a planting space that meets the needs of many plants: ample but not excess water, along with good fertility and drainage. They generally have limited pest problems. They can be built at a convenient height and shape for handicapped gardeners, and sized to fit small or large yards.

References

Bartholemew, Mel. 2005. All New Square Foot Gardening: Grow More in Less Space. Cool Springs Press, Brentwood TN

O'Callaghan, Angela. 2008. Soil solarization to control garden pests. University of Nevada Cooperative Extension FS-08-29

O'Callaghan, Angela. 2002. Home vegetable production in Southern Nevada. University of Nevada Cooperative Extension FS-02-61

Photo credits:

Figures 1,5,10, 13b – Elaine Fagin
Figures 2 – 12 Angela O'Callaghan
Figures 13a, 14 – ML Robinson
Figure 15 – Creative Commons

1. Wood should be resistant to rot; redwood is often used.
2. Fasten wide planks to an upright center post ~4” x 4” (not visible in picture) using water resistant heavy duty bolts or nails.
3. A wide board fastened to the top of the bed stabilizes it and serves as a seat.
4. Fill should be a rich medium – not field soil.

Figure 14. *Building a wooden raised bed.*

Because of their weight, concrete block beds may not need to be mortared together. The fill should not be field soil

Figure 15. *Building a block raised bed.*

WHAT IS UNIVERSITY OF NEVADA COOPERATIVE EXTENSION?

The mission of the University of Nevada Cooperative Extension is to discover, develop, disseminate, preserve and use knowledge to strengthen the social, economic and environmental well-being of people.

We're the outreach college of the University that brings you information to solve problems and deal with critical issues. We have 19 offices to serve you, whether you live on a ranch near the remote Rubies or in an urban setting in Las Vegas.

Area Locations

Central/Northeast Area

Southern Area

Western Area

State Administration

Southern Area Offices

Clark County (Las Vegas 702-222-3130)

Northeast Clark County (Logandale 702-397-2604)

Southern Clark County (Laughlin 702-299-1334)

Lincoln County (Caliente 775-726-3109)

So. Nye County (Pahrump 775-727-5532)