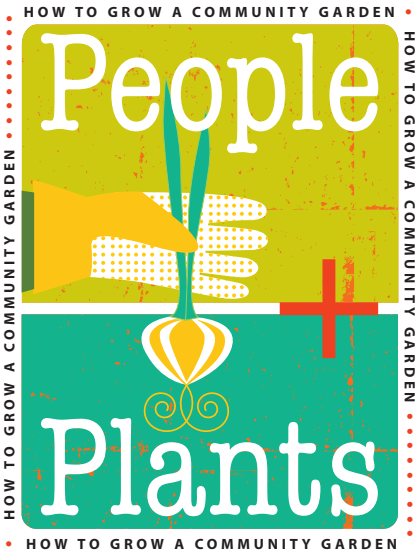

Patti Nagai

People+Plants is a multimedia series on how to build, maintain, and make the most of community gardens. For more titles and topics in the series, visit learningstore.uwex.edu.

A3905-04

Raised Beds and Containers for Community Gardens

A growing number of communities are embracing community gardens as a practical, positive force in our busy lives. Nurturing plants, watching flowers bloom, and harvesting produce all contribute to our general well-being. Gardening provides exercise, relieves stress, and promotes interaction with nature and neighbors. And fruits, vegetables, and herbs from the garden are edible delights that can improve our health through better nutrition.

Community gardens are as diverse as the people who tend them. Traditional in-ground garden plots marked with corner posts work for many, while others may not be able to garden in that style. Some participants find it difficult to walk to a garden plot, to bend over or kneel at the garden site, or to simply move around in a traditional in-ground garden. If you want your community garden to be amenable to all, consider alternative methods.

Above-ground gardening

Raised bed and **container** gardening are two styles that allow additional access and ease for gardeners of all ages and abilities. Both styles provide a structured site, a controlled soil blend, and easy access to plants. In addition, they allow for a longer gardening season, because the soil warms faster in the spring and the beds and containers can be easily covered to extend the season in the fall.

Controlled soil mixture

Soil can be an issue in community gardens, especially in urban areas. When determining where to place a community garden, start by looking into the potential site's history. Then have the soil tested. Some sites may not be conducive to building a community garden even with the use of raised beds, so learn all you can about the base soil (see *Soil Contaminants in Community Gardens* in the Additional Resources section).

It's important to know what you are dealing with before you invest time and resources into a new garden space. Perhaps the land was an urban dumping ground and retains concrete, glass, or other remnants of a previous building. Perhaps the soil is compacted, composed of heavy clay and rocks, or poorly drained, which will make gardening very difficult. Raised beds and containers allow you to mitigate some of these soil issues by bringing a controlled soil and compost blend to the site to create the garden space.

Improved accessibility

Raised bed and container gardens have advantages and disadvantages, but both methods help gardeners garden more easily. Physical limitations sometimes interfere with traditional gardening, but most people are comfortable working from a seat beside a raised garden area. People who use canes, walkers, or wheelchairs need this accommodation. Smaller-statured people and children also benefit from raised bed gardening, as the beds are designed to be easy to reach across and can be built at different heights to meet gardener needs.

Building accessible walkways between raised beds and containers helps participants get to their garden area. Provide large garden containers at the edge of a patio or walkway to make gardening doable for those with restricted mobility.

Considerations for using raised beds

There are many reasons for using raised beds, from avoiding bad soil to improving drainage to creating a more orderly and visually appealing garden. When building raised beds, be sure to think about the construction and materials before you start.

Construction

Raised beds can be as small as 3 x 3 feet or as large as 20 x 4 feet. The key is to keep them less than 4 feet wide to allow easy access from both sides. This access is important because you must garden from outside the raised bed to preserve the soil's texture and drainage properties; never walk or stand in a raised bed.

You can build your raised beds out of many types of materials or use preformed kits available at local garden centers, hardware stores, and online. Kit-built beds work well and are aesthetically appealing, but they can be expensive. If your community garden has a tight budget, there are many alternatives to choose from.

- Make simple raised beds without structured sides by mounding organic amended soils or compost on top of existing soil. Using an organic mulch such as pine bark, wood chips, or straw on the sides holds the soil in place and prevents it from eroding. These types of raised beds settle, so you need to re-create them each year.
- Use retaining wall block or cinder block to create a raised bed of any size. The height can vary; two to three courses of block provide a good height for children to sit on the side of the bed. A height of 30–32 inches allows a person in a wheelchair to pull up beside the raised bed to garden.

- If you prefer to use wood, cedar is long lasting but expensive. Copper-treated lumber is more cost effective than cedar and is considered safe to use in gardens, but it may not be allowed in gardens using organic methods.
- The composite wood blend boards often found in raised bed kits are long lasting but come in limited sizes. They typically do not warp or bow as many wood boards do over time, and they maintain their color and aesthetic appearance.
- Try using straw bales as the sides of your raised beds. Bales are inexpensive and make great seats for gardening. Straw degrades over time, though, so you'll need to replace the bales each year. You can add the old straw to your compost pile or use it as mulch.

Donated materials

Safety is the first thing you should think of when people offer you wood materials for your garden. The danger of using treated wood is not so much the uptake of chemicals into the vegetable crops but rather the likelihood that people will repeatedly touch the wood. Many of the metal-based and organic volatiles do not readily migrate into the soil and are not taken up by plants.

Older wood or wood from nonresidential use may contain **arsenic** from the chromated copper arsenate (CCA) pesticide used in pressure-treated lumber. Prior to 2004, CCA was commonly used to treat wood for playsets, decks, and outdoor furniture. The arsenic it contains can be absorbed through the skin; the biggest risk is to people, especially children, who touch it.

Likewise, most railroad ties or telephone poles were treated with **creosote**, which contains more than 100 different chemicals, including some known carcinogens. There is no approved use for creosote-treated materials in residential settings or community gardens (see Additional Resources).

Raised beds can be constructed from a variety of materials including retaining wall block, cinder block, and wood.

Small hoop houses are one way to extend the growing season in raised beds. To build them, cover bent PVC or metal pipe with floating row cover (frost cloth) or clear plastic.

Considerations for using containers

Containers allow you to grow vegetables in limited spaces. They can be moved easily and allow complete control over the soil mix. In addition, plants grown in containers are easy to maintain, have fewer weeds, and are a snap to harvest. However, you need to select the right containers and crops if you want to be successful. Not all vegetable crops thrive in the confined space of a container. Consider smaller plants, determinate types of tomato, and cultivars specifically bred for containers. Many of the vegetables selected as All-America Selection winners are well suited for containers (see Additional Resources).

Large containers placed at the edge of a patio or walkway offer garden access to those with restricted mobility.

Container selection

Selecting suitable containers for growing edible crops can be challenging, because they come in all materials, sizes, and shapes. Basic factors to consider are the size of the container, the porosity of the material, drainage, and how long the container will last.

- You can use metal containers, but leaching may occur depending on the type of metal and soil pH. Using a plastic liner remedies this.
- Plastic containers are popular because they are lightweight and retain moisture longer than clay or wooden containers. If you are reusing plastic containers, make sure they were not used for chemical storage in a previous life, and remember to drill many holes in the bottom for drainage. Eventually plastic containers will degrade and crack, but most will last several seasons.
- Clay pots can be glazed or unglazed. Glazed ceramic containers hold moisture better, but some glazes contain lead. Unglazed containers dry out more quickly. Clay and ceramic pots generally need to be stored for the winter.
- Concrete containers are relatively inexpensive and durable. They come in all sizes, but they are very heavy to move. Large concrete containers that will stay outside should be freezeproof, which generally means the walls of the container must be at least 1.5 inches thick.

- Fiberglass containers are lightweight and available in large sizes suitable for vegetables. Much like plastic pots, these containers weather with age.
- Wood containers last longer when a plastic liner is used, but even with a liner they will decay over time with exposure to the weather. To improve drainage, drill holes in the bottom.
- Pressed fiber containers are lightweight and hold moisture well. They can be made out of many plant-based materials such as coir, corn, rice, or straw. Some last longer than others, but all are designed to biodegrade over time when exposed to soil and moisture.

Donated containers

Safety is of primary concern when considering whether to use donated containers in your community garden. Be sure to learn the history of the containers being offered. If the containers were previously used for food products, they should be safe to use for growing edible crops. If they were used for pesticides, petroleum-based chemicals, or paints, politely decline the donation.

Soil mix

Use a soil mix that's clean, well drained, and high in organic matter such as compost, peat, or ground bark. Soil—or soilless mix—can be purchased premixed, or you can blend it from clean topsoil, compost, and an inorganic drainage material such as perlite or vermiculite. A good rule of thumb for blending is to use one-third topsoil, one-third compost, and one-third drainage material, but this ratio can vary greatly. The best soil blend will depend on a number of factors such as soil type and which plants you will be growing. For more information, contact your county Extension office (see Additional Resources).

Incorporate a slow-release fertilizer for best vegetable production over the growing season. For best root growth and drainage, make sure the soil mix is the same throughout the container. There's no need to place any stones, shards, or other material at the bottom of the container. If you are concerned about the soil mix escaping through the drainage holes, cover the holes with newspaper or a paper coffee filter. These materials will keep the soil in without interfering with water flow. And they will degrade over time as the roots grow and form a layer that holds the soil in place.

See the table below for an idea of how much soil mix is needed to fill a variety of commonly used containers. Keep in mind that soil mixes vary in density and will settle with time and watering.

Raised bed and container gardening in practice

Once your raised beds and containers are planted, the following techniques will help you keep them as productive as possible throughout the growing season.

Succession planting

Maximize production in your raised beds and containers by scheduling new plantings once harvesting is done. Plan your garden according to cool- and warm-season crops to extend the growing season. Learn which plants grow best in the cool seasons of spring and fall and which plants grow better in the heat of the summer (see *Common Crops for Community Gardens* under Additional Resources).

Remove any residual plant debris from the harvested crop before you replant. In containers, you may need to add more soil mix or compost if you lose a significant amount of soil when removing the previous crop. In raised beds, remove debris and rake the soil to provide a fresh planting surface for seeds or transplants.

Amount of soil mix needed to fill common container sizes

Common containers	Pot size (width x height, in inches)	Soil	
		(cubic feet)	(dry quarts)
3-gallon nursery pot	10.5 x 19	0.49	12.6
5-gallon nursery pot	11.5 x 10.5	0.63	16.2
Medium clay pot	15.5 x 11.3	0.85	21.9
Half whiskey barrel	24 x 18	4.14	106.5
Half wine barrel	28 x 18	5.53	142.2

Intensive gardening techniques allow you to maximize the yield of compact gardening spaces.

Square foot gardening

Gardening by the square foot is one technique for maximizing space. By blocking off the garden area into one-foot sections, you can plan your plantings according to a set grid pattern of spacing. For example, you would plant only one tomato per square but in the adjacent square you could plant nine beets. Sample plans are available (see Additional Resources).

Planning and spacing is very important in raised bed gardening. The increased organic matter and good drainage of the amended soil are conducive to intensive gardening (see sidebar on square foot gardening). These special techniques allow you to tuck more plants into tight spaces and get multiple harvests in a single location. Be sure to leave room for growth when you plant seeds and transplants—spacing is important even in intensive gardening.

Gardening provides exercise, relieves stress, and promotes interaction with nature and neighbors.

Square foot gardens are arranged in squares instead of rows.

Irrigation

Raised beds tend to be very well drained, especially if the soil blend is high in organic matter. Monitor soil conditions carefully to make sure your plants are getting the water they need to grow and produce successfully. When flowering, vegetable crops such as tomato, eggplant, pepper, and beans need uniform moisture to ensure a good-quality harvest. As temperatures rise and the plants grow, you may need to water your raised beds as often as every other day; at a minimum you will need to apply at least one inch of water each week if there is no significant rain. One inch of water will soak 12 inches into a well-drained soil.

Some community gardens invest in watering systems such as sprinklers or drip irrigation systems on timers. These can be a costly but worthwhile investment. Drip irrigation—or hand watering at the soil level—is a healthier option for the plants because overhead watering can result in increased fungal diseases on the leaves.

Containers require frequent watering to maintain plant health and productivity. The bigger the plants and smaller the containers, the more water needed. And as vegetable plants gain leaf area and start flowering and fruiting, their water needs increase. You will need to water most containers every day.

The end of the growing season

You can easily use season extenders to prolong your growing season when using raised beds and containers, but when the freeze comes it is good to have them cleaned up and ready for winter.

- Clean and prepare your raised beds for spring planting by removing plant debris. Some cool-season crops such as mustard, collard, and kale can be fall-seeded and overwintered in raised beds. Garlic can be planted in fall in raised beds for harvest in early July. Winter mulch, such as a layer of clean straw or compost, will protect the winter crop when applied after the soil freezes. Regardless of whether you plant your beds, place floating row covers over them in the fall to keep them clean from leaf debris and digging squirrels.
- Containers should be emptied and stored in a protected area to increase their longevity. Those that remain filled with soil will freeze over the winter in cold climates and possibly crack as the soil expands. And it's a good idea to start each new growing season with fresh soil mix for optimal growth. You can add the used soil to your compost pile at the end of the growing season.

Raised bed and container gardening provide alternatives to traditional garden styles that benefit community gardens, especially in urban environments. If you carefully select your materials, soil mix, and plant types, your garden and gardeners will enjoy an abundance of healthy crops.

Drip irrigation systems can be expensive, but they offer a convenient way to keep plants watered at the soil level.

Additional resources

Your local Extension office

In Wisconsin
yourcountyextensionoffice.org

Outside of Wisconsin
www.csrees.usda.gov/Extension

UW-Extension publications

The following publications are available from the Learning Store at learningstore.uwex.edu.

Soil Contaminants in Community Gardens (A3905-03)

Common Crops for Community Gardens (A3905-05)

Online resources

All-America Selections for container vegetable cultivars
www.all-americaselections.org

American Community Gardening Association
www.communitygarden.org

Environmental Protection Agency guidelines for the use of creosote
www.epa.gov/pesticides/factsheets/chemicals/creosote_main.htm

Square Foot Gardening
www.squarefootgardening.org

UW-Extension Horticulture
hort.uwex.edu

UW Extension
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Raised Beds and Containers for Community Gardens (A3905-04) I-03-2014