



Extension FactSheet

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Container Vegetable Gardening

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Introduction

If you have poor garden soil, limited space, not enough sun in the garden area, or impaired mobility, you may want to grow vegetables in containers. Containers allow you to have a movable garden with the opportunity for a limited vegetable supply, or a supplemental source of vegetables that are difficult to locate for purchase. Container gardening also affords better pest management and a chance to have color in areas where you want it. Container vegetable gardening is also a great way to introduce children to gardening.

The downside of container gardening is that containers need frequent watering. Since the root system is restricted by the size of the container, some plants may produce smaller fruit, and some vegetables don't grow well in containers. Vegetables that grow well in containers are those with a confined habit of growth, such as salad greens, spinach, eggplant, Swiss chard, beets, radish, carrots, peppers, bush beans, determinate tomatoes, bush varieties of summer squash and cucumbers, green onions, and many herbs. It isn't that other vegetables can't be grown, but that they may not be as suitable for container culture.

Types of Containers

There are two main types of container materials, non-porous and porous. Examples of non-porous containers are glazed pots and those made of plastic, metal, and glass. Clay is the primary type of porous material. Wood and pressed fiber pots are considered semi-porous. When determining the type of container

you want to use, consider the frequency of watering required, weight, and cost. Incidentally, decorative pots without drainage holes are unsuitable for container gardening.

There are a number of different container shapes, including half barrels, whiskey barrels, tubs, boxes, pots, and 5-gallon pails. Wooden containers are often lined with plastic to slow the deterioration of the wood. At least four drainage holes are recommended in the bottom of each container. You may drill them yourself if a purchased container doesn't have an adequate size or number of drainage holes.

In terms of the correct container size for the vegetable you are growing, the general rule of thumb is, "the bigger the better." Plant roots need plenty of room in order to produce the kind of results you want from your container garden. Many vegetables don't do well if their roots are restricted, and plants won't



be as vigorous nor as productive. This is especially true for cucumbers and squashes. When gardeners have trouble with their container-grown vegetable plants, even if they've fertilized, watered and done everything else correctly, the problem can usually be traced to the fact that the plant's roots had a restricted root environment for optimal growth and production. In the vegetable variety list at the end of this fact sheet, suggested pot sizes are included for each vegetable.

Tomatoes produce best in containers of at least 20" or 22" diameter, peppers grow best in 16" diameter pots, and vining crops require a 20" or larger container. Greens, such as lettuce and spinach, have shallow roots and thus do well in broader, flatter containers. Another way to approach this is to think in terms of one to two gallon container capacities for peppers, chard and dwarf tomatoes, while four to five gallons per plant is best for tomatoes, cucumbers, squash, and eggplants.

Potting Mixes

A container potting mix needs to provide water, nutrients, and support for the plant(s), and should be well-aerated, well-drained, and lightweight. Do not use 100% garden soil (often clay soil), which is too heavy, dense, and compact. It dries out rapidly, may be too acid or too alkaline, and may contain fungal pathogens, weed seeds, or disease organisms.

Use either a soilless mix or soil mix for your container. **Soilless mixes** are readily available commercially, and include Jiffy Mix[®], Bacto[®], Promix[®] and Jiffy Pro[®]. These mixes are made up of peat moss, vermiculite, and either coarse sand or wood products. Vermiculite holds several times its weight in water and nutrients, and keeps container mixes moist. The soilless mixes are lightweight and may be the best choice if the container is to be moved frequently. A **soil mix** is often made up of one part sphagnum peat moss or compost, one part pasteurized soil, one part vermiculite or perlite, and some composted cow manure. Soil mixes tend to hold water better than soilless mixes.

The size of the container you chose will depend on the mature size of the plant it will contain. A plant will stop growing and become stunted if it is growing in too small a container. Examples of plants and recommended container volumes are:

Peppers, chard and dwarf tomatoes:	soil volume of 1-2 gallons per plant
Full-sized tomato plants, cucumbers:	soil volume of 4-5 gallons per plant
Lettuce, radish, onions, and beets:	6"-10" diameter pots
Most herbs:	4"-6" diameter pots

Estimating soil mix to use:

4" pot:	1 pint soil
6" pot:	3 pints soil
8" pot:	1½ gallons soil
10" pot:	2½ gallons soil
12" pot:	3½ gallons soil
14" pot:	4½ gallons soil
16" pot:	5½ gallons soil
20" pot:	6½ gallons soil

Planting

Plant vegetable transplants or seeds as you would plant normally in a ground bed. Tomato plants can be placed deeper in the pot (one-third to one-half deeper) and the stem covered with soil to stimulate root development along the stem.

Your container vegetables will likely need support. Tomato cages can be used for smaller tomato plants, peppers, and cucumbers. Cone or pyramid-shaped trellises usually work better than flat types. You can make a cage from concrete reinforcing wire or lighter weight fencing material. All types of stakes work well to give vegetable plants support. A few stakes can be placed around the perimeter of the pot to form a teepee.

Before you plant, put landscape cloth or screen in the bottom of the pot to retain the soil mix. Some gardeners like to use foam peanuts or crushed aluminum cans in the bottom third of a pot. This reduces the pot's weight, however, the downside is that there is less soil available to the roots, and end of season clean-up is somewhat more complicated. After planting, no more than one inch of mulch can be added to the soil surface to retain moisture and moderate high summer temperatures.

If you plan to move large, heavy containers around, rolling platforms can be placed under them to aid in moving them. These may be purchased or made at home.

Fertilizer

There are two types of fertilizers: timed-release and water soluble. Both are needed for container vegetable growing success. Slow or timed-release is added at planting time, and should be thoroughly incorporated into the soil mix. Look for a complete, balanced type such as a 10-10-10, 13-13-13 or 14-14-14 formulation. Osmocote® in a 14-14-14 formulation is just one example of a slow-release fertilizer that can be used. The ratio of this fertilizer to soil mix is 1/2 tablespoon of fertilizer to one gallon of soil mix. Thus, a 3 gallon container would need 1½ tablespoons of fertilizer, a 5 gallon would need 2½ tablespoons, and so on.

Water soluble fertilizers are added about mid-season when the plants begin to produce. This additional fertilizer is needed because most potting mixes don't retain nutrients very well, the plant's roots are restricted and thus somewhat stressed, and watering leaches nitrogen out of the soil. Peters® 20-20-20 or Miracle Gro® 15-30-15 are just a couple of the water soluble types that work well for container gardening. Some experienced container vegetable gardeners have success with a "super bloom" type of fertilizer, one with a high phosphorus content to stimulate blooms and subsequent fruits. If you want to experiment with this type of fertilizer, look for a 10-50-10 or 19-59-9 analysis. These water soluble fertilizers should be mixed at a slightly weaker rate than the label recommends and added once every week or two.

Watering

Container plants are exposed to the extremes of weather more so than plants in ground beds. Wind and scorching sun will increase the need for watering. Water-holding gels (starch-based gels that retain water, called "hydrogels") can be incorporated in the soil mix before it is put in the container. They swell with moisture and release it when needed; they could perhaps prevent a second watering on a hot day. Even with hydrogels or other organic amendments designed to hold water, containers may need daily watering on a very hot day, and some may need water twice a day.

If a plant is allowed to become too dry, the feeder roots are damaged. When finally watered, the plant's energy is used to grow new feeder roots and not for flowering or fruit growth, resulting in a stressed plant.

If watered too heavily or too frequently during the summer, most of the soil nutrients can be washed out the bottom of the container. Gauge the moisture need of the soil mix by sticking your finger or a Popsicle stick into the soil; if the soil sticks to your finger or the Popsicle stick, water isn't needed. You can also lift the container to determine if it needs water; after planting, gauge the weight of the container dry. Then water, and gauge the weight of the container when wet.

Mulches can be placed on top of the soil mix to reduce moisture loss. Compost, straw, pine needles, grass clippings, shredded bark, and leaf mold are examples of acceptable mulches. Move containers to shady areas for part of the day to reduce moisture loss. Drip irrigation can be used for watering, and tenting the plant with a row-covering type of fabric can shade the plant from the hot sun.

Additional Maintenance

Maintenance can be reduced by good siting of containers, choosing plants suitable for container culture, choosing plants with known pest resistance, and proper and timely maintenance. Container vegetables need to be checked daily, and will probably require more maintenance than vegetables grown in the ground. Check daily for insects, mites, and signs of disease, and implement integrated pest management practices if needed.

End of the Season Clean Up

At the end of the season, discard the entire contents of each pot; don't even add debris and potting mix to the compost pile. Do not reuse the mix the following season; you do not want to run the risk of spreading diseases that may be present in the mix or on the plant debris. Also, the potting mix has been depleted of nutrients. Scrub each container and disinfect it with a 10 percent chlorine bleach solution.

Most non-porous containers may be left outside over the winter, although you may want to store them in your garage or basement to keep them clean. Porous clay containers should be brought inside to prevent cracking due to freezing temperatures.

Suggested Vegetable Varieties for Container Growing

The following is a list of suggested varieties for vegetable container growing in the Midwest. This is not an exhaustive compilation. You may find other varieties that will do just as well. The important thing to remember when seeking suitable varieties is to look for those described as “bush” or “compact” in growth habit, and any varieties that have been especially bred or hybridized for container growing.

Vegetables	Varieties/Cultivars	Container Size
Beans, Lima	Bush Baby, Fordhook Bush Lima, Fordhook 242	12" wide, 8-10" deep
Beans, Snap	Bush Romano, Contender, Provider, Tendercrop Stringless, Bush Blue Lake	8" wide, 8-10" deep
Beets	Baby Canning, Spinel Little Ball, Red Ace Hybrid, Burpee Golden	6"-12" deep
Broccoli	Any variety but Crusader	20" deep
Brussels Sprouts	All varieties	12" wide, 12" deep
Cabbage	Baby Head, Dwarf Morden, Minicole, Fast Ball, Flash	8"-10" wide, 12" deep
Carrots	Short root or round, Nantes, Gold Nugget, Best of the Bunch, Little Finger, Baby Spike, Short & Sweet, Thumbelina	10" wide, 10" deep
Chard	Any variety	8-12" deep
Chinese Cabbage	Bok Choy, Michihli, Wong Bok	20" deep
Collards	Any variety	12" deep
Corn	Space saving varieties, F-M Cross, Golden Bantam, Kandy Korn, Precocious	21" wide, 8" deep. Need 3 plants per container to assure pollination.
Cucumber	Salad Bush, Burpee Hybrid II, Bush Crop, Spacemaster, Burpee Pickler, Bush Champion, Fanfare, Pickalot, Picklebush, Pot Luck	20" wide, 16" deep
Eggplant	Dusky, Morden Midget, Bambino, Millionaire	16" deep
Horseradish	Maliner Kren	5 gallon or larger
Kale	Any variety	8" wide, 8" deep
Kohlrabi	Grand Duke	12" deep
Lettuce	Black-seeded Simpson, Red Sails, Salad Bowl, Tom Thumb, Green Ice, Little Gem	8" wide, 6-8" deep
Onion	Bunching types work best: White Pear, Japanese Bunching, Beltsville Bunching, Crystal Wax Pickling PBR	10-12" deep
Peas	Little Marvel, Sugar Bon, Sugar Mel, Laxton's Progress, Sugar Rae, Melting Sugar, Burpee's Blue Bantam, Early Patio, Snowbird	12" deep
Peppers	Any variety	16" deep
Potatoes	Charlotte, Kennebec, Red Pontiac, Irish Cobbler, Epicure	1-20 gallon containers
Pumpkins	Autumn Gold Hybrid, Bushkin, Jack Be Little, Small Sugar, Baby Boo	5 gallon tub
Radish	Cherry Belle, Early Scarlet, French Breakfast, Sparkler, Burpee White, Comet. Avoid winter radishes.	4-6" deep
Spinach	Any variety	4-6" deep
Squash, Summer	Early Yellow Summer, Crookneck, Goldbar, Park's Creamy Hybrid, Straightneck, Scallopine, Peter Pan, Gold Rush, Pic-N-Pic Hybrid, Richgreen Hybrid, Sunburst	24" deep
Squash, Winter	Butterbush, Bush Acorn, Table King, Cream of the Crop	24" deep
Tomatoes	Patio VF, Pixie, Small Fry VFN, Yellow Pear, Sweet 100, Tumbling Tom, Container Choice, Rutgers, Tiny Tim, Husky Red, Husky Gold, Yellow Canary, Whippersnapper, Basket Pak, Red Cherry, Gardener's Delight, Sundrop	Dwarf—12" deep Standard—24" deep
Turnips	Any variety	10-12" deep

Karen and Annette are both active Master Gardeners in the Franklin County program. They are especially interested in vegetable gardening, and have provided leadership in a vegetable cultivar trial garden, located at Waterman Farm on the Ohio State University campus.

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