



Vegetable Gardening in Containers

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If your vegetable gardening is limited by insufficient space or an unsuitable area, consider raising fresh, nutritious, homegrown vegetables in containers. A window sill, a patio, a balcony or a doorstep will provide sufficient space for a productive mini-garden. Problems with soilborne diseases, nematodes or poor soil conditions can be easily overcome by switching to a container garden. Ready access to containers means that pest management is easier. Container vegetable gardening is a sure way to introduce children to the joys and rewards of vegetable gardening.



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Crop Selection

Almost any vegetable that will grow in a typical backyard garden will also do well as a container-grown plant. Vegetables that are ideally suited for growing in containers include tomatoes, peppers, eggplant, green onions, beans, lettuce, squash, radishes and parsley. Pole beans and cucumbers also do well in this type of garden, but they do require considerably more space because of their vining growth habit.

Variety selection is extremely important. Most varieties that will do well when planted in a yard garden will also do well in containers. Some varieties of selected vegetables which are ideally suited for these mini-gardens are indicated in Table 1.



Small fruited tomato varieties make excellent hanging baskets.

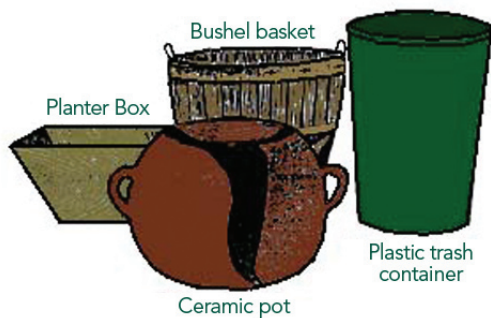
Table 1. Varieties for Container Grown Vegetables

Broccoli (2 gallons, 1 plant)	Packman, Bonanza, others
Carrot (1 gallon, 2-3 plants. Use pots 2 inch deeper than the carrot length)	Scarlet Nantes, Gold Nugget, Little Finger, Baby Spike, Thumbelina
Cucumber (1 gallon, 1 plant)	Burpless, Liberty, Early Pik, Crispy, Salty
Eggplant (5 gallons, 1 plant)	Florida Market, Black Beauty, Long Tom
Green Bean (2 gallons minimum, space plants 3 inches apart)	Topcrop, Greencrop, Contender, (Pole) Blue Lake, Kentucky Wonder
Green Onion (1gallon, 3-5 plants)	Beltsville Bunching, Crysal Wax, Evergreen Bunching
Leaf Lettuce (1 gallon, 2 plants)	Buttercrunch, Salad Bowl, Romaine, Dark Green Boston, Ruby, Bibb
Parsley (1gallon, 3 plants)	Evergreen, Moss Curled
Pepper (5 gallons, 1-2 plants)	Yolo Wonder, Keystone Resistant Giant, Canape, Red Cherry (Hot), Jalapeno
Radish (1gallon, 3 plants)	Cherry Belle, Scarlet Globe, (White) Icicle
Spinach (1 gallon, 2 plants)	Any cultivar
Squash (5 gallons, 1 plant)	Dixie, Gold Neck, Early Prolific Straightneck, Zucco (Green), Diplomat, Senator
Tomato (5 gallons, 1 plant)	Patio, Pixie, Tiny Tim, Saladette, Toy Boy, Spring Giant, Tumbling Tom, Small Fry
Turnip (2 gallons, 2 plants)	Any cultivar

Growing Media

Any growing media must provide water, nutrients, and a physical support in order to grow healthy plants. A good growing media must also drain well. Synthetic or soilless mixes are well suited for vegetable container gardening and may be composed of sawdust, wood chips, peat moss, perlite, or vermiculite. These are free of disease and weed seeds, hold moisture and nutrients but drain well and are lightweight. Many synthetic soil mixes such as Jiffy Mix®, Bacto®, Promix®, and Jiffy Pro® are available at garden centers. Soilless mixes can also be prepared by mixing horticultural grade vermiculite, peat moss, limestone, superphosphate and garden fertilizer. To 1 bushel each of vermiculite and peat moss, add 10 tablespoons of limestone, 5 tablespoons of 0-20-0 (superphosphate) and 1 cup of garden fertilizer such as 6-12-12 or 5-10-10. Mix the material thoroughly while adding a little water to reduce dust. Wet the mix thoroughly before seeding or transplanting. Soil mixes are made up of equal parts of sphagnum peat moss or compost, pasteurized soil, and vermiculite or perlite. Composted cow manure is then added to improve the soil's physical properties and as a nutrient source. Soil mixes tend to hold water better than soilless mixes.

Containers



Almost any type of container can be used for growing vegetable plants. For example, try using bushel baskets, drums, gallon cans, tubs or wooden boxes. The size of the container will vary according to the crop selection and space available. Pots from 6 to 10 inches in size are satisfactory for green onion, parsley and herbs. For most vegetable crops such as tomatoes, peppers and eggplant, you will find that 5 gallon containers are the most suitable size, while 1 to 2 gallon containers are best for chard and dwarf tomatoes. Smaller container sizes are appropriate for herbs, lettuce, and radish crops. They are fairly easy to handle and provide adequate space for root growth.

Any well-drained container can become a productive mini-garden.

Container materials are either porous or nonporous. Glazed, plastic, metal, and glass containers are nonporous. Regardless of the type or size of container used it must drain adequately for successful yields.

Adding about 1 inch of coarse gravel in the bottom of the container will improve drainage. The drain holes work best when they are located along the side of the container, about $\frac{1}{4}$ to $\frac{1}{2}$ inch from the bottom.

Seeding and Transplanting

Vegetables that can be easily transplanted are best suited for container culture. Transplants may be purchased from local nurseries or can be grown at home. Seeds can also be germinated in a baking pan, plastic tray, pot, or even a cardboard milk carton. Fill the container with the media described above and cover most vegetable seed with $\frac{1}{4}$ inch to $\frac{1}{2}$ inch of media to insure good germination. Another method is to use peat pellets or peat pots which are available from nursery supply centers. Landscape cloth or screen in the bottom of the pot will improve drainage and invigorate plant growth.



Green onions, radishes or beets can be grown in a cake pan.



Covering the seed flat with a clear plastic bag will hasten germination.



A "tube" or bag garden is an easy method to grow vegetables.

The seed should be started in a warm area that receives sufficient sunlight about 4 to 8 weeks before you plan to transplant them into the final container. Most vegetables should be transplanted into containers when they develop their first two to three true leaves. Transplant the seedlings carefully to avoid injuring the young root system. (See Table 2 for information about different kinds of vegetables.)

Table 2. Planting Information for Growing Vegetables in Containers

Crop	Number of days for germination	Number of weeks to optimum age for transplanting	General size of container	Amount of light*	Number of days from seeding to harvest
Beans	5-8	-	Medium	Sun	45-65
Cucumbers	6-8	3-4	Large	Sun	50-70
Eggplant	8-12	6-8	Large	Sun	90-120
Lettuce, leaf	6-8	3-4	Medium	Partial Shade	45-60
Onions	6-8	6-8	Small	Partial Shade	80-100
Parsley	10-12	-	Small	Partial Shade	70-90
Pepper	10-14	6-8	Large	Sun	90-120
Radish	4-6	-	Small	Partial Shade	20-60
Squash	5-7	3-4	Large	Sun	50-70
Tomato	7-10	5-6	Large	Sun	90-130

*All vegetables grow best in full sunlight, but those indicated will also do well in partial shade.

Fertilization

Available fertilizers will be either time-release or water soluble. Time-release fertilizer is mixed with the potting media at planting time. Osmocote® is a pelleted time-release fertilizer with 14-14-14 formulation. Water soluble fertilizers, on the other hand, are added to water and used when plants begin to grow actively. Peters® 20-20-20 or Miracle Gro® 15-30-15 are two examples sold in most garden centers.

The easiest way to add fertilizer to plants growing in containers is to prepare a nutrient solution and then pour it over the soil mix. There are many good commercial fertilizer mixes available to make nutrient solutions. Always follow the application directions on the label. You can make a nutrient solution by dissolving 2 cups of a complete fertilizer such as 10-20-10, 12-24-12, or 8-16-8 in 1 gallon of warm tap water. This mixture is highly concentrated and must be di-



A potato bag is a unique way to grow potatoes.

the mix becomes water-logged, the plants will die from lack of oxygen. Avoid wetting the foliage of plants since wet leaves will encourage plant diseases. Remember to use the nutrient solution for each watering except for the weekly leaching when you will use tap water.

Water-holding gels are becoming popular for use in container gardening. These starch-based gels are called hydrogels. They absorb at least 100 times their weight in water and slowly release that water into the soil as it dries. To be effective, they should be incorporated in the soil mix before planting.

Mulches can also be placed on top of the soil mix to reduce water loss. Compost, straw, pine needles, grass clippings, shredded bark, and moss are examples of mulches and vary in their effectiveness.

Light

Nearly all vegetable plants will grow better in full sunlight than in shade. However, leafy crops such as lettuce, cabbage, greens, spinach and parsley can tolerate more shade than root crops such as radishes, beets, turnips and onions. Fruit bearing plants, such as cucumbers, peppers, tomatoes and eggplant need the most sun of all. One major advantage to gardening in containers is that you can place the vegetables in areas where they can receive the best possible growing conditions.

Harvesting

Harvest the vegetables at their peak of maturity when a vegetable's full flavor has developed. Vine-ripened tomatoes, tender green beans and crisp lettuce will have the best flavor.

At the end of the harvest season, discard the plant and soil from the pot. Do not reuse the same soil for a second season of production. Infected soil or mix will spread disease into the second season unless it is properly composted. Properly composted planting media can be reused.

luted before it can be used to fertilize the plants. To make the final fertilizing solution, mix 2 tablespoons of the concentrated solution in 1 gallon of water.

If you use transplants, begin watering with the nutrient solution the day you set them out. If you start with seed, apply only tap water to keep the soil mix moist enough until the seeds germinate. Once the plants emerge, begin using the nutrient solution.

While the frequency of watering will vary from one crop to the next, usually once per day is adequate. If the vegetable produces a lot of foliage, twice a day may be necessary. Plants require less water during periods of slow growth.

At least once a week, it is advisable to leach the unused fertilizer out of the soil mix by watering with tap water. Add enough water to the container to cause free drainage from the bottom. This practice will flush harmful minerals out of the the soil mix.

It is a good idea to occasionally water with a nutrient solution containing minor elements. Use a water-soluble fertilizer that contains iron, zinc, boron and manganese and follow the label directions carefully.

Watering

Proper watering is essential for a successful container garden and one watering per day is usually adequate.

However, poor drainage will slowly kill the plants. If



"Cages" can be used with containers to support tomatoes, cucumbers and pole beans.

Diseases and Insects

Vegetables grown in containers are susceptible to the same insects and diseases that are common to any vegetable garden. You should check your plants periodically for diseases and for foliage and fruit-feeding insects. If you detect plant disease or harmful insects, use EPA-approved fungicides and insecticides in a timely manner. Contact your local county Extension agent for the latest information on disease and insect control on vegetable plants.

Table 3. Common Problems in Container Gardening

Symptom	Cause	Corrective Measure
Plants tall, spindly, and unproductive	Insufficient light	Move container to area receiving more light
	Excessive nitrogen	Reduce feeding intervals
Plants yellowing from bottom, lack vigor, poor color	Excessive water	Reduce watering intervals; Check for good drainage
	Low fertility	Increase fertility level of base solution
Plants wilt although sufficient water present	Poor drainage and aeration	Use mix containing higher percent organic matter; increase number of holes for drainage
Marginal burning or firing of the leaves	High salts	Leach container with tap water at regular intervals
Plants stunted in growth; sickly, purplish color	Low temperature	Relocate container to warmer area
	Low phosphate	Increase phosphate level in base solution
Holes in leaves, leaves distorted in shape	Insects	Use EPA-recommended insecticide
Plant leaves with spots; dead dried areas, or powdery or rusty areas	Plant diseases	Remove diseased areas where observed and use EPA-recommended fungicide

Container Gardening Success

Container gardening can be successful if you follow guidelines above. Plant growth and vigor will vary depending on the location and attention you give your plants. The following guidelines are golden rules for any home vegetable garden:

1. Inspect your plants daily and, if necessary, water, trim, train or pruning.
2. Check your plants daily and remove of pests and weeds and treat diseases.
3. Continue your education by soliciting advice from experienced gardeners.
4. Make time to sit down and enjoy the fruits of your labor.

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