

# Gardening in Containers

Gardening in containers offers many benefits for both the plant and the school gardener. It provides a **means to control the environment**, allowing for optimization of the growing culture for plants when those conditions can not be met naturally. It also provides the opportunity for a school to **overcome challenges** that might limit the garden in scope or area.

## Optimize Cultural Conditions

Plants can be grown in containers when the **soil is poor** in nutrients or water holding capacity; polluted with toxins or heavy metals; compacted by foot and construction traffic; infested with nematodes and other soil borne pests, or where competition from tree roots limits growth. The **growing medium can be amended** to provide optimum drainage, nutrients, PH and water holding capacity to meet the unique requirements of each individual plant. Vigorous growers such as mints and bamboos can also be planted in pots to **restrain** their rambling habits.



Container gardening **liberates the gardener from his/her geography**. Each plant can be placed where it will receive the best light conditions whether in sun or shade. Tropical and frost-sensitive plants can spend the summer outside and then come indoors for the winter. Vegetables can be started indoors to extend the season. Since the soil in the pots heats up quickly, gardeners can get a jump on the season. Unique plants that inhabit wetlands and bogs are not out of reach when using containers.

## Space and Flexibility

Containers allow **options for those with limited outdoor spaces**, and where a traditional garden is awkward or impossible. A window sill, patio, deck, balcony, rooftop, driveway, stairway or even a front stoop can be an opportunity for small-scale gardening. Take to the rooftop and plant a container garden in light weight soil-less potting media. When space is limited consider vertical gardens. Add window boxes outside the



classroom or on vertical racks. Use hanging baskets on patios. Build vertical planting walls of wood, with planting boxes lined with sphagnum moss or plastic. Be sure to consider watering needs and don't forget the climbers such as gourds, beans and tomatoes. Many flowers, fruits and vegetables have been bred specifically for container culture.

**Container gardens are non-permanent and portable**. Take the garden with you when you move or when school closes for the summer. Place plants in the public view when they are in full bloom. Move them when they have outgrown their space or when the sun's position changes seasonally. Repot and replant to freshen displays, and when there are storms or a danger from frosts plants can be moved indoors or clustered in a corner away from wind and freezing temperatures. Experiment to optimize environmental conditions.

## Beauty and Instant Display

Container gardens can supply instant display. They elevate their contents above the ground and put plants “on stage,” where they can really show off their flowers and foliage. Use them to add color, fragrance and pizzazz to the school entranceway or student pick-up area. Group them to add a spot of color or hide an eyesore such as an air intake. Add a few to the borders of your school garden to provide color early in the season when your in-ground plants have not yet come to maturity. Weatherproof containers, planted with hardy perennials or woody shrubs, add year-round sculptural interest to the garden. Keeping your garden colorful and interesting can help maintain support and momentum during the school year.



*Perkins School for the Blind in Watertown*

## Garden with Ease

Gardening chores such as watering, feeding, weeding, staking, spraying and removing faded blooms are easily managed in containers. To save time and energy group them in just a few areas. Containers also provide a solution for areas where soil conditions prevent growing water loving plants, since soil conditions in the pot can be amended. Container gardening can also make gardening more accessible. Raised containers can put the garden within reach of those who can not bend over, or who must sit when they garden.

## Wildlife Habitat

Container gardens can even be used to supplement habitat for wildlife. Provide favorite foliage, nectar, pollen, berries, seeds and nuts. Incorporate feeders to supplement food and supply water, cover, and sheltered places to raise the young. Use sustainable practices. Additionally if wildlife is your problem in the garden, raised containers located on a playground hard surface or hanging planters may discourage pests.



## Stress and Challenges

Some of the same **elements that make container gardening ideal for the gardener can add environmental stress for the plants.** Pots hold only a limited amount of soil in which roots can spread. The soil temperature in containers is higher than that in the ground. During the heat of summer, roots growth may be restricted as the soil can be too hot near the sides of the container. Darker pots will heat up more quickly than lighter colored ones, and are better suited for the shade. Pruning can help keep plant foliage in proportion to its roots, thus protecting the plant from drying out to quickly.

Containers dry out very quickly and **vigilance with watering is essential.** Clay pots are especially porous and lose water from the sides. Group plants with similar moisture requirements in one container. Place those plants that require a lot of water in the shade. A 2-3 inch layer of mulch placed on top of the soil surface will cool the soil and help it retain moisture. It increases soil fertility as it decomposes and prevents crusting on the surface, allowing water to penetrate to the root zone.

**Self-watering pots** can help make your containers more low-maintenance by holding a reservoir of water internally for your plants. This can help if you are not able to water the garden during vacations and weekends. Self-watering containers can be bought, or made in a tote container, bucket or large pot.



## Types of Containers

Containers come in many sizes, shapes, and styles. **The size of the container needed will vary according to the plants selected, space available and the size and number of plants to be grown in the container.** It should be large enough to support plants when fully grown; hold soil without spilling; have adequate drainage, and never have held products that would be toxic to people or plants. Avoid containers with narrow openings.

**Almost anything can be used for a growing container** from stoneware pots to small terracotta or plastic pots, bushel baskets, drums, gallon cans, tubs, wooden boxes or found objects such as old boots, wheelbarrows, barrels or even an ancient bathtub.

**Commercial pots are made of many materials including:** clay, ceramic, metal, wood, inexpensive and lightweight plastic, resin and fiberglass. Choose a container that works aesthetically and functionally. Look for lightweight containers for raised structures and rooftops. Build your own window boxes, planters and vertical gardens from wood and make hanging baskets from moss and wire. A large and easy to find container for the school garden is the tree pots used by local nursery or landscaping companies. These large black pots can be painted to make them attractive in the garden.

**Clay pots** are available in unglazed and glazed styles. Unglazed terracotta pots are porous and withstand a range of temperatures, however, they break easily.

**Glazed clay** pots aren't as porous and do not dry out as quickly as terracotta, They come in a range of colors. Most low-fired ceramic flower pots must be stored inside during the cold months.

**Stoneware** is high-fired pottery where the clay turns vitreous and glass-like. It comes in many decorative colors and is stronger and heavier than earthenware. It does not absorb water and will not break in winter if filled with a soil medium (with or without plants).



## Container Culture

**Soil:** “Soilless” potting mixtures are best, because they drain rapidly, hold enough moisture for the plant’s roots, are light weight, are free of disease and weed seeds and are available at all garden stores. Bags of these medium can be purchased at most nurseries or garden centers. You can also use garden compost or make your own mix from equal parts of sand, loamy garden soil and peat moss.

Consider adding a packet of water-retaining polymers to the soil. They can hold several hundred times their weight in water, making it available to plants longer. Mycorrhizal fungi can also be added to improve the ability of the roots to take up water and nutrients.

Check the requirements of your plants and determine whether you’ll need to amend the soil. Peat moss can add more water holding capacity for moisture-loving plants, and perlite, coarse sand, pea gravel or turf face are good for those plants that like to dry out between waterings. Commercial mixes are usually slightly acidic, so you may need to add lime for plants with a preferred alkaline PH.

**Watering:** Proper watering is essential. Most containers will require water at least once a day. Water well, so that the water drains from the bottom of the pot. Plants that are pot bound, or in a very sunny or windy location, may need more than one watering a day. Avoid wet foliage which encourages diseases by adding water directly to the soil. Poor drainage will water-log the soil. If you find that the water remains on the surface of the soil for more that a few moments, repot with new soils that contains lots of organic materials. A layer of stones or broken pottery at the bottom of the pot will prevent blockage of the drainage holes in the pots - allowing for free drainage.



**Fertilization:** Fertilization is important to keep container plants blooming and healthy. Container mixes drain rapidly, washing nutrients from the soil with each watering. Use a nutrient solution and pour it over the soil mix to fertilize. There are many good commercial fertilizer mixes available, including organic feeds. Lighter soil mixes require more frequent fertilizing. During the summer, when actively growing and flowering, plants can be fertilized well once a week, or use a dilute solution at each watering. Plants usually need only a fertilizer with N-P-K (Nitrogen, Phosphorus and Potassium). Occasionally, you can add a fertilizer that also contains minor trace elements. Flush the container well every one-or-two weeks to reduce the build up of salts associated with water soluble fertilizers. Do this by filling the container to the top with water. Let it drain and repeat two or three times.

**Caution:** Never fertilize your plants with a liquid fertilizer when the soil is totally dry. Doing so will burn the tiny root hairs from the roots of the plant. Without these root hairs the plant will not be able to obtain water and will die.

**Light:** Most container grown plants, especially those grown for their flowers and fruits, will grow and produce better in full sunlight, with a minimum of six hours of direct light a day. However, some plants are shade tolerant, and a few are even shade loving. Get to know the sun and shade availability of your site before you select plants. Then choose plants that are best suited to your environmental conditions.



**Diseases and Insects:** Plants grown in containers can be attacked by various types of insects and diseases. Inspect them periodically for the presence of foliage and fruit-feeding insects as well as the occurrence of diseases. Should problems occur, your local nursery or garden center can advise.

## Planting Permanent Pots

Durable containers can be planted seasonally with annuals or permanently with shrubs, trees or perennials. Permanently planted containers offer a year-round display outdoors. However, since container culture exposes the plant's root zone to much colder winter temperatures than those planted in the ground, some plants that are hardy in the ground may not be root hardy in containers over the winter. Yet, many evergreen shrubs, dwarf conifers, grasses and herbaceous perennials will survive these low winter temperatures above ground.

There are many container materials to choose from including: rot-resistant wood, cast stone, metals such as zinc, hypertufa and even durable plastics that mimic terracotta. Stoneware, even unglazed, becomes vitreous from its high firing and does not absorb water and break like soft, low-fired earthenware. The container should be large enough to prevent frequent drying. For small trees and shrubs, a minimum pot size of 18-24" is required.

**To prevent breakage of stoneware pots**, be sure to keep them filled with growing medium throughout the winter. When empty, they will fill with water and freeze. Raise containers off the ground by setting them on several bricks to ensure drainage. This also prevents stress fractures that occur when the bottom of pots are frozen to the ground while the tops are warmed by the winter sun.

**Drainage is the most important factor in the potting mix.** A coarse mixture composed of composted bark, peat-moss, perlite and loam works well. As with any container, watering is essential, especially into the fall. Hardy trees and shrubs should not be fertilized frequently and do not need a regime of root pruning and repotting. They will reach and maintain an equilibrium of top growth to roots.

Favorite plants that survive and even thrive in containers year-round include: witch hazel, pine, false cypress, spruce, elm, arborvitae, birch, nine bark and willow.

*by Warren Leach*



## Make your Own Container

Consider making your own pots, troughs, benches, bird baths and more out of hypertufa. The only ingredients needed are: water; 3 buckets Portland cement; 3 buckets mason's sand (fine textured sand), and 3 buckets sifted peat moss.

Measure the cement, peat moss and sand and add them to a wheelbarrow. Use a hoe or small shovel to blend thoroughly. Add water and blend again. The amount of water required varies, so add a little at a time. The hypertufa is ready to be molded when you can squeeze a few drops of water from a handful.

Form the hypertufa in boxes lined with plastic or make a polystyrene form from 2" insulation, secured with 2 ½" deck screws and reinforce with gaffer's tape. If you are making a planting container, be sure to provide adequate drainage holes.

Pack the hypertufa firmly and tamp down. Continue adding and tamping until hypertufa reaches the preferred depth or fills the form.

Cover with plastic; dry for 48 hours. Remove the box or form and sculpt by knocking off corners and sharp edges. Add texture and grooves to sides with a paint scraper or screwdriver. Brush surface with a wire brush.

Wrap the piece in plastic, and put it in a cool place to cure. The longer it cures the stronger it will be. After at least a month, unwrap and let it cure in the open for several more weeks. If making a planter, periodically rinse with water to remove some of the alkalinity. Add vinegar to the rinse to speed this process.

After the planter has cured outside for several weeks, move it inside away from any sources of moisture, to cure for another week or so. Then apply a coat of masonry sealer to basins or other pieces that must hold water.



## Plants for Containers

There are many plants that can be grown outdoors in containers throughout the summer. A few will live outdoors in the gardens for years. Most must be brought indoors for the winter, while still other are allowed to live for just one year and die with the frost. Here are a few container recommendations:

**Annuals for Containers:** alyssum; amaranth; begonia; browallia; California poppy; cleome; coleus; geraniums; helichrysum; impatiens; lantana; lobelia; marigolds; nasturtiums; nicotiana; pansies; periwinkle; petunias; portulaca; salvia; senecio; snapdragons; sunflowers; thunbergia; verbena and zinnias.

**Vegetables for Containers:** beans; beets; broccoli; lettuce; cabbage; Chinese cabbage; carrots; cucumbers; eggplant; garlic; gourds; lettuce; New Zealand Spinach; onions; pepper; potato; radish; Scarlet runner beans; spinach; squash and tomato.

**Herbs for Containers:** alpine strawberries; basil; beebalm; dill; chives; coriander; dill; germander; johnny jump up; lady's mantle; lamb's ear; lavender; lemon verbena; gem series marigolds; mint; nasturtium; pineapple sage; rosemary; rue; sage; santolina, scented geraniums; thyme; viola and yarrow.

**Tender Perennials for Containers:** Tender perennials are tropicals that would be hardy in their own native environment but are not hardy outdoors in our New England winters. Plant tender tropicals can be planted in a container. and bring them indoors before the first frost. These tender perennials include: banana, bay, citrus, ginger, lemon grass, lemon verbena, peanuts, pineapple mint, pineapple sage, rosemary, scented geraniums and society garlic.

**Hardy Perennials for Containers:** Many temperate zone perennials can be planted outdoors in a container and will be hardy through the winter. These include: *Coreopsis verticillata*; *Geranium macrorrhizum*; *Gypsophila repens*; *Hemerocallis*; *Hosta*; *Iris sibirica*; *Pulmonaria*; *Sedum spectabile*; *Sedum* 'Matrona' and *Yucca* 'Bright Edge.'

**Hardy Grasses for Containers:** *Helictotrichon sempervirens*; *Calamagrostis* 'Overdam'; *Hakonechloa*; *Molinia caerulea* 'Variegata'; *Panicum* 'Heavy Metal', and *Pennisetum* 'Hameln'.

**Hardy Woody Trees & Shrubs for Containers:** *Aralia spinosa*; *Cornus* 'Silver & Gold'; *Cotinus* 'Purpureus'; *Hammamelis* (Witch Hazel) cultivars; *Malus* (Crabapple) cultivars; *Myrica pensylvanica*; *Physocarpus* 'Luteus' and 'Diablo'; *Rhus* 'Laciniata'; *Spiraea* 'Gold Flame'; *Spiraea* 'Goldmound'; *Spiraea* 'Ogon'; *Ulmus parviflora* 'Seiju' and Evergreen Shrubs; *Chamaecyparis obtusa gracilis*; *Juniperus* varieties; *Picea abies* 'Little Gem'; *Pinus mugo*; *Taxus cuspidata*; and *Thuja occidentalis* 'Rheingold.'



At the Manthela George School in Brockton, black nursery pots are painted in Art Class, planted with vegetables indoors and set out in the garden after frost.



## Create a Bog Garden

Unique plants that naturally grow in wetlands and bogs suffer when planted in most garden soil. To successfully grow these water loving beauties, regardless of soil type, you can easily make a bog-like garden container within the garden. It will create a barrier to hold water rich soils while also preventing roots of nearby plants from overtaking the wetland plants.

**To make the bog garden**, dig a hole 24 inches deep and wide enough to hold the plants that you will be adding. Use a rubber pond liner or a couple of layers of heavy plastic to line the bottom and sides of the bog and create a barrier.

Fill with the soil removed from the hole, supplemented with at least 30 percent rich organic matter. Trim the top of the liner at the soil level.

When filled, water well to saturate the soil. Let stand for a day before planting. Depending upon whether the new bog garden is located in the sun or shade, select water loving plants that meet the available solar needs.

In full sun, plant cranberries, bog rosemary, Japanese Iris, Japanese Sweet Grass (*Acorus calamus*), Blueberries, Winterberry Holly (*Ilex verticillata*) or carnivorous plants such as sundews and pitcher plants.

In a shady bog, try growing Filipendula, Ligularia, Meadowsweet (Spiraea), Sweet pepperbush (*Clethra alnifolia*), and Sweetshrub (Lindera).

Consider adding the bog to an area where rainwater frequently channels. The rich organic soil will collect the water as it travels across the surface, recharging the bog and preventing soil wash out from the runoff. During droughts add supplemental water to keep the bog plants thriving.



*Water garden with bog planter surrounding the water, planted with cranberries.*



*Bog Planting in a barrel*

## Moveable Pizza Garden

A moveable garden in a container can provide just the right solution when there are issues with contaminated soil, vandalism or you are running a short term program that ends before a garden can be harvested.

Collect plastic containers ranging from 5 gallon buckets to one-or-two gallon deli containers. You can even use 2-3 gallon nursery pots. Make sure that each container will drain well when watered. Drill holes to add extra drainage where needed. Give each student their own container in which to plant a garden. You may even want to personalize the containers with paint.

Students will fill the bottom of their container with a layer of coarse sand or gravel. Then they will fill their containers with a good quality potting mix. Give each student a young tomato, pepper and basil plant. You can also add arugula, garlic, oregano, thyme and other herbs and vegetables such as cucumbers and eggplant. Plant and water. Move the gardens as needed. Send them home with students for the summer. In the fall you can harvest and make a pizza and salad.

### Activity Ideas

1. Select a tropical country and study the plants that would grow there naturally. Find cuttings or seeds from these plants and grow them in containers.
2. Visit a local nursery to learn about container plants. Which ones are most suitable for your school environment?
3. Select a variety of plants with different water requirements, from wetland to desert. Select a container and soil medium for each and try growing them in the classroom.
4. Construct and plant a vertical garden, using wood, wire and plastic bag liners to hold the plants vertically.
5. Make an alpine trough garden. Research the needs of plants that grow in alpine areas. Plant and grow these alpines.



*Potatoes Growing in black Nursery Pots*

## Container Gardening Resources

**Massachusetts Flower Growers' Association**  
8 Gould Road  
Bedford, MA 01730-1241  
781-275-4811    [www.massflowergrowers.com](http://www.massflowergrowers.com)

**Massachusetts Nursery & Landscape Association**  
P.O. Box 387  
Conway, MA 01341    [www.mnla.com](http://www.mnla.com)

**Tranquil Lake Nursery - Warren Leach**  
45 River Street    Rehoboth, MA 02769    [www.tranquil-lake.com](http://www.tranquil-lake.com)

**UMass Extension Plant Culture Sheets**    [www.umassgreeninfo.org/fact\\_sheets/index.html](http://www.umassgreeninfo.org/fact_sheets/index.html)

### Other Websites

**Container Gardening for Wildlife**    [www.nwf.org/backyardwildlifehabitat/container.cfm](http://www.nwf.org/backyardwildlifehabitat/container.cfm)

**Container Gardening Lessons**    <http://aggie-horticulture.tamu.edu/floriculture/container-garden/lesson/index.html>

**Container Gardening with Children**    [www.fns.usda.gov/tn/Parents/gardening.html](http://www.fns.usda.gov/tn/Parents/gardening.html)

**Container Vegetable Gardening**    [www.ext.vt.edu/departments/envirohort/articles/vegetables/contgrdn.html](http://www.ext.vt.edu/departments/envirohort/articles/vegetables/contgrdn.html)

**Drought Resistant Plants for Pots from the Brooklyn Botanic Garden**  
[www.bbg.org/gar2/topics/design/handbooks/potted/drought.html](http://www.bbg.org/gar2/topics/design/handbooks/potted/drought.html)

**Fine Gardening - Hypertufa Trough Article**    [www.taunton.com/finegardening/pages/g00117.asp](http://www.taunton.com/finegardening/pages/g00117.asp)

**Guide to Container Gardening**    [www.gardenguides.com/Tipsandtechniques/container.htm](http://www.gardenguides.com/Tipsandtechniques/container.htm)

### Books

*The Complete Container Garden*, David Joyce, Reader's Digest, 2003.

*Container Gardening*, Storey Publishing Wisdom Series.

*Container Water Gardens*, Phillip Swindells, Barron's Educational Series, 2001.

*The Edible Container Garden: Growing Fresh Food in Small Spaces*, Michael Guerra, Simon and Schuster, 2000.  
*Gardening in Containers: Creative Ideas from America's Best Gardeners*, Fine Gardening Editors, Taunton Press, 2002.

*Growing Herbs in Containers*, Sal Gilberte and Maggie Oster, Storey Publications.

*Roof Gardens, Balconies and Terraces*, David Stevens and Jerry Harpur, Rizzoli Publishing. 1997.

Information for this newsletter was taken from the resources listed above.

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**P. O. Box 345    Seekonk, MA 02771**  
**[www.aginclassroom.org](http://www.aginclassroom.org)**

Please Visit the Massachusetts Agriculture in the Classroom Website to tell us how you used this Gardening in Containers Resource for the School Garden.



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