



UNIVERSITY OF
MARYLAND

EXTENSION

Solutions in your community

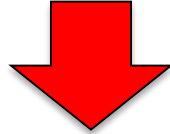


Container Gardening and Gardening in Small Spaces

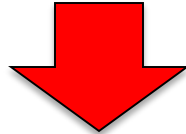




UNIVERSITY OF
MARYLAND



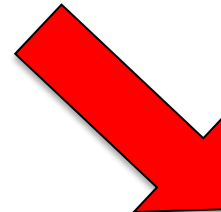
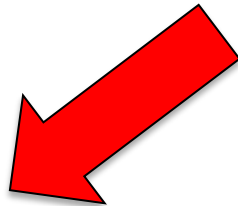
College of
**Agriculture and
Natural Resources**



UNIVERSITY OF
MARYLAND

EXTENSION

Solutions in your community





Gardening for Small Spaces



- Why garden in containers?
- What kind and size containers?
- What media/soil?
- Where is the best location for the container?
- How much water?
- How to plant and care for the container?
- What are the best plants?
- How to create visual impact?
- How to winterize?



Why Garden in Containers?

- Fun way to grow plants in just about any situation
- Easy to get started
- Cure “brown thumb”
- Variety of plants appropriate to grow in containers
- Easy to personalize
- Transportable





Growing Advantages



- Perfect for everybody - kids, people with physical limitations, novice gardeners, a gardener wanting to downsize and save time
- No digging or tilling
- Weed free
- Inexpensive to start up
- Overcome typical garden complaints:
 - too shady for tomatoes
 - poor quality soil
 - persistent soil-borne disease



Growing Advantages



- Temporary or permanent containers can be fitted in any location
- Locate containers where they are most convenient
- Better control over growing conditions water, sunlight, nutrients and pH





Growing Advantages



- Easier to protect plants from extreme weather conditions, insect pests and bigger critters



- Vertical growth saves space and allows space of exterior walls
- Start earlier in the spring and extend growing season into fall



Container Types



- Containers can be temporary, practical, whimsical, artistic, expensive or free.
- Commercially produced containers can be purchased at garden centers and through mail order catalogs.
- Objects can be recycled or transformed into suitable containers – 5 gallon plastic buckets, truck tires, wooden crates, ½ whiskey barrels, nursery pots, kids' wading pools, and plastic storage containers.





Too Hot/Too Dry



- Dark colors will create higher soil temperatures that could injure young tender roots and prevent the full development of a plant's root system
- A smaller or shallow container will need to be watered more often
- Coconut pot liners and containers made from porous materials (clay, ceramic, concrete, and wood) will dry out more quickly than containers made from plastic, or metal



Too Wet

- All containers should have holes or slats in the bottom to allow water to drain out.
- A pot within a pot will allow for easy removal and replacement when plants fade, but the outer container might collect excess water that will need to be drained, not only for the health of the plant, but to keep mosquitoes from breeding.





Wrong Material



- Avoid treated lumber products if you are growing food.
- Be aware that plastics not made for outdoors use can become brittle from exposure to the elements.
- Some materials, such as terra cotta, may crack in freezing temperatures.



Too Heavy

- Consider size, weight and shape. A larger container can be very heavy
- A 20-inch container filled with moist growing medium can weigh 100 pounds!
- Containers should be heavy enough to not topple over in winds





Pots for Herbs and Vegetables

What size pot do I need?

Match container size to plant size, both the top growth and root system.

Don't squeeze large plants into small containers. It restricts root growth too much, and plants don't grow well.

Recommended media depth:

- 4-6 inches: salad greens, Asian greens, mustards, garlic, radish, basil, cilantro, thyme, mint, marjoram. (Salad greens and some herbs have shallow, fibrous root systems and are well suited to shallow containers with a large surface area).
- 8-12 inches: beans, beets, chard, carrots, chard, cabbage, pepper, eggplant, tomato, squash, rosemary, parsley, lavender, fennel.

Required pot volume:

- 1-3 gallons: herbs, green onions, radishes, onion, chard, pepper, dwarf tomato or cucumber, basil.
- 4-5 gallons: full-size tomato, cucumber, eggplant, beans, peas, cabbage, and broccoli.



Just Right





What's the “Dirt” on Growing Media?



- Growing medium has three main functions:
 1. Supply the roots with nutrients, air & water
 2. Allow for maximum root growth
 3. Physically support the plant
- Roots grow in the spaces between individual particles of soil
- Water carries nutrients that plants need
- Air is needed for root growth
- If excess water cannot drain away, fresh air cannot enter and roots will suffocate
- Select light and fluffy growing media for good aeration and root growth
- Use new soil in pots each year





Appropriate Growing Media For Containers



Commercial Soil-Less Mixes and Potting Soil

- Excellent choice for containers
- Lightweight, drain well, hold water and nutrients, and are generally free of weeds, insects, and diseases
- pH is about 6.2
- May include sphagnum peat moss, perlite, vermiculite, compost, coir, and small amounts of lime and fertilizer. Peat moss retains moisture and perlite allows water to drain.
- “Organic” soil-less mixes contain no chemical wetting agents and substitute organic for chemical fertilizers
- Examples of soil-less mixes are: ProMix™, ReddiEarth™, Jiffy Mix™, and Sunshine Mix™





Media Mixtures For Vegetables



Some good media mixtures for container vegetables are:

- 100% compost
- 100% soil-less mix
- 25% garden soil + 75% compost
- 25% soil-less mix + 25% garden soil + 50% compost
- 25% garden soil + 75% soil-less mix
- 50% soil-less mix + 50% compost



Growing Media Not Appropriate For Containers



- Other types of commercial mixes are designated as “top soil,” “planting soil,” and “planting mix.” They vary widely in composition and quality.
- Avoid mixes that contain sedge peat, feel heavy or gritty, have very fine particles, or appear clumped.
- Bark Fines and Wood Mulch - these are high in carbon and low in nutrients and are not recommended

Garden Soil

- Holds water and nutrients very well but can drown roots growing in a container
- Diseases and weed seeds can be a problem
- Heavy – an advantage if you are trying to anchor top-heavy plants and pots, but a disadvantage if you want to move pots





Compost



- Compost is the dark, crumbly, earthy-smelling product of organic matter decomposition.
- Leaves, grass clippings, wood waste, and farm animal manures are some of the common ingredients that are combined with water in piles or windrows and digested by huge populations of oxygen loving microorganisms.
- LeafGro™ is a well-known commercially available yard waste compost in Central Maryland. It's highly recommended to include some compost in the growing medium for your containers.





Green & Growing



Fertilizers

- Regardless of the growing medium used you will need to fertilize plants regularly.
- Nitrogen, required in large quantities by vegetables, is easily lost in the water that drains from the bottom of your containers.
- University of Maryland researchers doubled pepper production by using *slow-release fertilizer* with 100% compost in 5-gallon containers.





Green & Growing

- “How much” and “how often” to fertilize depends on many factors: type of fertilizer, plant needs, type of container, etc.
- Even “quick” crops like leaf lettuce or broccoli raab that mature in 35-45 days may need to be fertilized several times.
- Long-season crops like tomato, cucumber, eggplant, and pepper may need to be lightly fertilized every 2 weeks or so, to produce a continuous harvest.





Container Location



- Containers can be placed on any level surface - decks, balconies, along driveways, side walks, hanging baskets and window boxes
- Access to water - some containers will need water every day
- Be careful of microclimates
- The water that drains from containers can stain concrete and wood decking





Container Vegetable Gardening

- 6-8 hrs sun for warm season vegetable crops
- 4-5 hrs sun for cool season vegetable crops





Container Ornamental Gardening

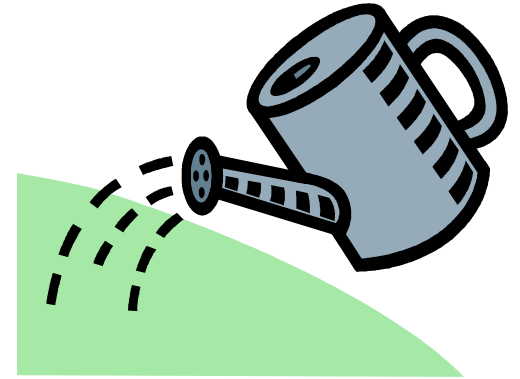


- If your area gets at least 6 hours of direct sun, you can choose plants for “full sun.”
- If your area gets 3-6 hours of direct sun each day, choose plants for “partial sun/partial shade.”
- If your area gets less than 3 hours of direct sun each day, choose plants for, “shade.”





Happy Roots



Water

- The limited volume of growing medium available to container vegetable plants makes it critical to keep the root system moist at all times.
- Watering needs will vary depending on container size, ambient temperature, wind, sunlight, and humidity.
- Count on watering most container vegetable plants daily during the summer months. The growing media should always be moist, but not soggy. Add water slowly until you see it drain out the bottom (except for some “self watering” types.)
- Use a watering can or nozzle on the end of a hose that produces a soft stream of water. Be careful not to use hot water! It can burn leaves and young roots.



Happy Roots

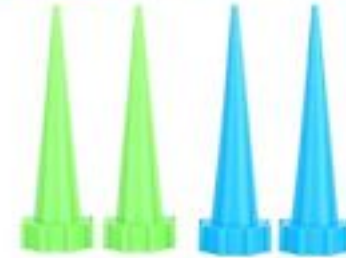


- Vegetable quality and yield are greatly reduced by wilting from a lack of water.
- Drought stress will kill feeder roots and slow plants down.
- Large, mature plants need more water than seedlings and young plants.
- Micro-irrigation with soaker hoses and drip emitters is efficient, convenient, and relatively inexpensive.
Consider a combination of drip emitters plus timer for automatic watering.





Other Watering Systems





Self-Watering Containers

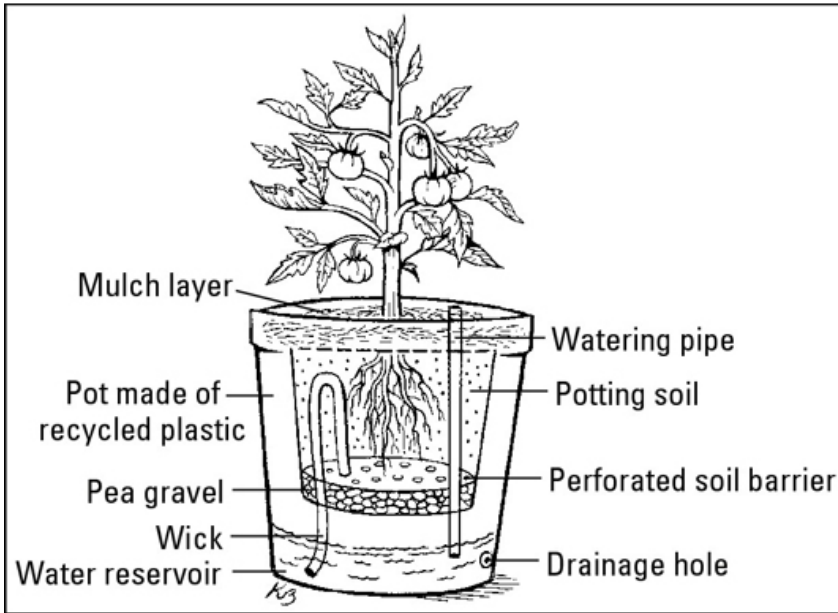


- “Self-watering” containers are a relatively new gardening concept. Instead of drainage holes in the bottom, these containers have an overflow hole on one side. The growing medium sits on a perforated platform directly above a water reservoir. In most cases, water is wicked up from the reservoir into the medium.
- Self-watering containers help conserve water and nutrients and make it possible to ignore your containers for a few days.
- The simplest application is to place a saucer under a pot. The excess water is wicked up into the media or pulled up by roots that reach the saucer. Empty saucer every 2-3 days to keep mosquitoes from breeding.
- A number of commercial self-watering models are available or you can make your own.



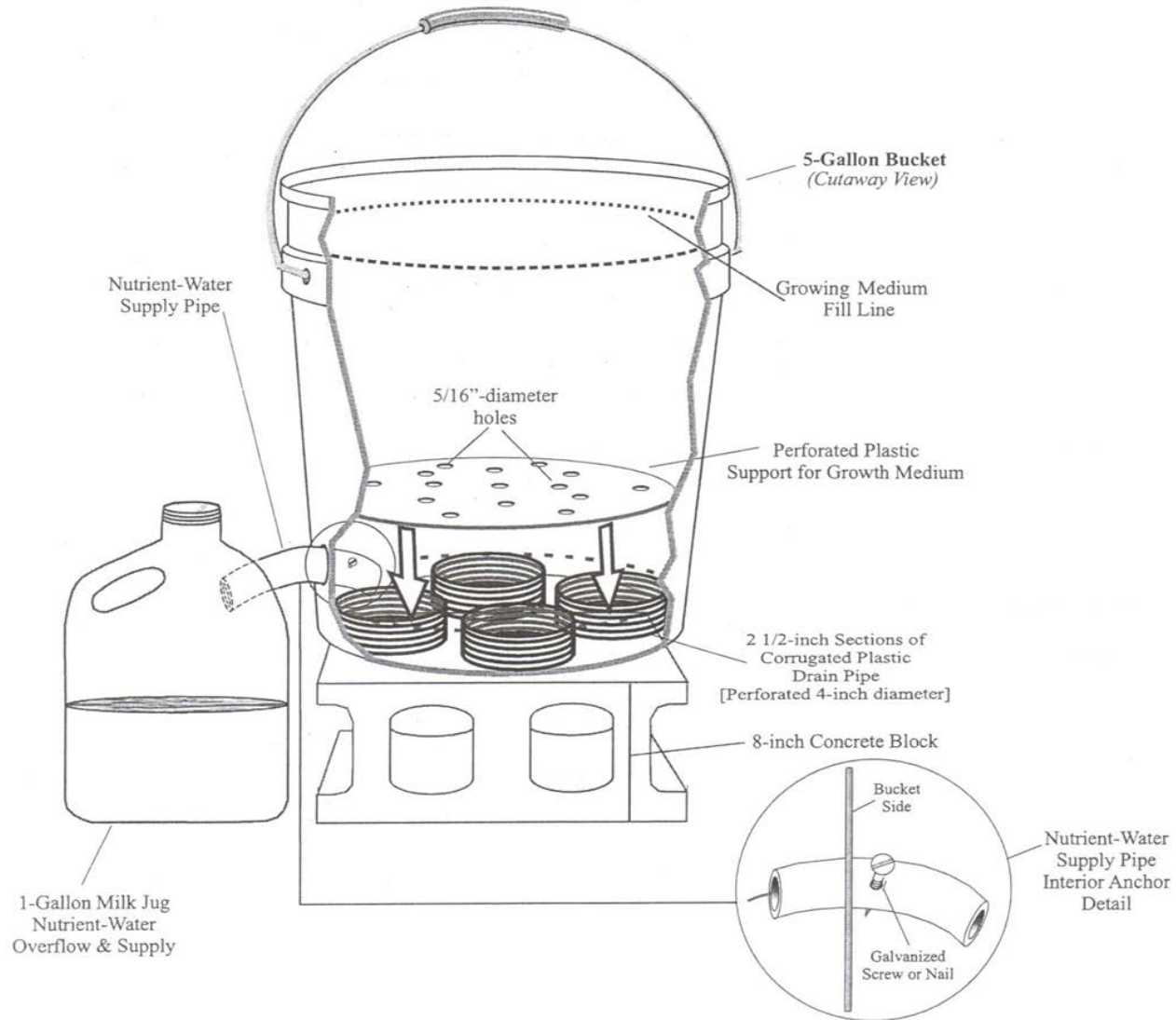


Self-Watering Containers



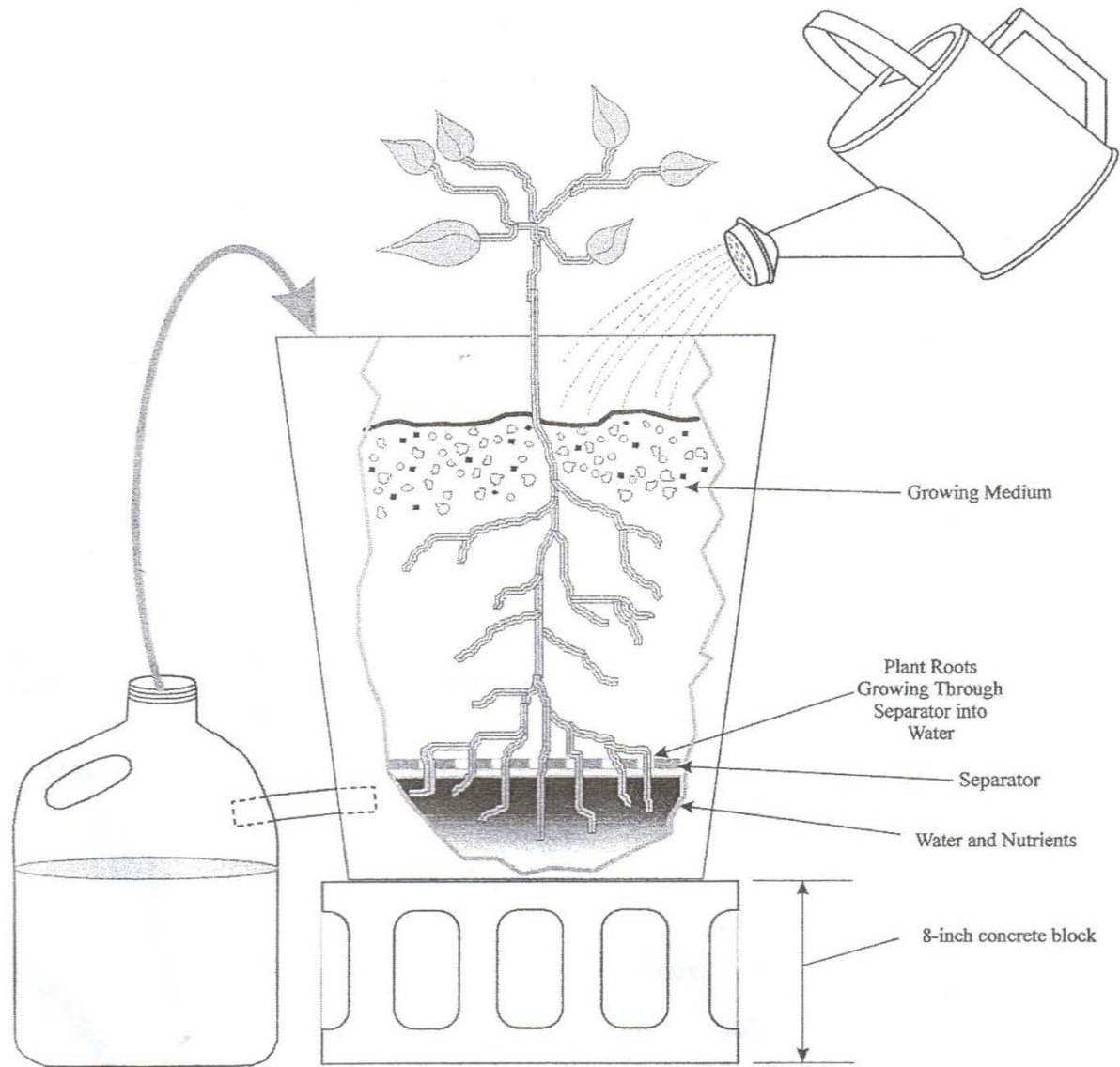


Self-watering mini-garden (cutaway view)





Workings of a self-watering container (cut away view)





Planting & Care



When it is time to plant

- Don't fill the bottom of the container with pebbles, gravel, or rocks unless you need the added weight to prevent tipping.
- Cover drainage holes with mesh, gravel, paper towels, or a coffee filter, to prevent soil from washing away.
- Prior to planting, use a trowel or your hands to thoroughly work water into the growing medium. This is especially important for soil-less mixes containing peat moss.
- Fill loosely (don't cram!) to within an inch or so of top of container. Follow seed packet directions for planting, spacing, and care.
- Plant seedlings (except tomatoes) at same level as they were growing in pot or six-pack. Tomatoes can be planted deeper, for stronger root growth.



Planting & Care



Keep those plants growing!

- Three-season planting (a.k.a. “succession planting”): When spring lettuce or radishes are spent, re-plant the container in late May with pepper plants, beans or cucumber seed. In early fall you can plant kale, lettuce or broccoli raab to finish out the season. Don’t forget to fertilize after each crop!
- When perennials are done blooming, change out the pot for a new perennial that is about to bloom.
- Give them support. Cucumbers, pole beans, peppers, tomatoes, and eggplant will all benefit from some type of vertical support.
- Move plants around if containers are portable to maximize sunlight (for heat-loving/sun-loving plants) and shade (for summer-grown salad greens and shade-loving plants).





Planting & Care



Diagnosing Plant Problems



- Container grown plants are subject to the same insect and disease problems as garden grown plants, but container gardeners tend to have fewer problems. **NOT EVERY BUG IS A BAD BUG!**
- The biggest causes of plant problems are lack of water and nutrients, and overcrowding. Plants can also suffer root rot from too much water, especially if the growing mix does not drain well.
- Go to extension.umd.edu/hgic for additional help in diagnosing plant problems.

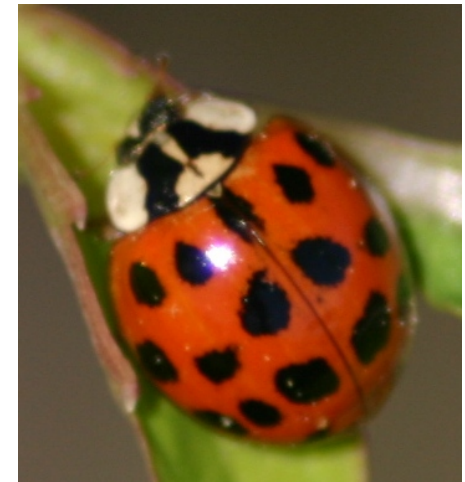




Organic Gardening



- Emphasizes soil improvement through the regular addition of organic matter
- Biological and genetic diversity to manage insect and disease problems
- Reduce exposure to chemical pesticides
- An example: utilizing recycled containers, backyard or locally produced compost, and planting flowers to attract beneficial insects in order to create an ecological garden



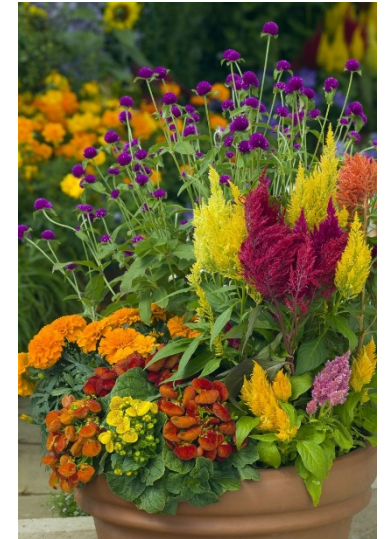


What Plants?

Anything! Everything!

Bulbs

Annuals





What Plants?

Sedum/Succulents

Cactus



Eastern Prickly Pear



Hypertufa Trough



Moss rose
Portulaca
grandiflora





What Plants?

Vines

Herbs





What Plants?

Perennials



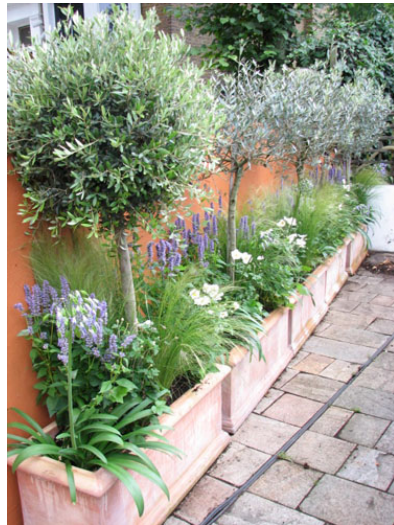


What Plants?

Grasses/Sedges

Shrubs

Small trees





What Plants?

Vegetables

Just about any vegetable!

Popular, easy container crops:
salad greens, peppers, eggplant, tomatoes, beans,
chard, beets, radish, squash and cucumbers.

More challenging crops include melons, corn, potatoes,
and sweet potatoes.

Look for “bush” or “dwarf” varieties , esp.
tomatoes (determinate), cucumbers, squash.

The key is to experiment!





Visual Impact

- Keep containers together to increase humidity and water retention, to increase visual impact (and to make watering easier).
- When mixing plants, create a thriller (tall upright), spiller (trails over pot) and filler (mounding plant that fills in the overall mass)





Visual Impact

- For attractive and versatile containers, mix herbs, lettuces and flowers.
- When mixing plants, pair plants that like the same conditions. For example:
Herbs such as lavender, thyme, oregano, marjoram, and chives require a loose growing medium, and dry conditions and full sun. These could be paired with sedums or Portulaca.





Visual Impact



Other considerations:

- Consider color, form, line, proportion and texture.
- Think big. Incorporate trellises and supports to add height and drama. Place plant on a pedestal to elevate it. Group pots to make the display larger.
- When grouping pots, something should be the same, so it doesn't look like a hodgepodge:
 - Same shape, different sizes
 - Same pot material (concrete, glazed, fiberglass, etc.)
 - Same color
 - Same plant form in all containers
 - Same color flowers
- Grasses and bamboo add movement as they sway in the breeze.





Visual Impact

Other considerations:

- Shady spots need brighter colors for impacts.
- Use a specimen plant as an anchor and change out annuals and perennials as they fade.
- Dead head. Promotes re-blooming and is more attractive.
- Prune to keep plant growth in check, or to stimulate bushy, compact growth rather than leggy, branching growth.





Winterizing Plants in Pots



Herbaceous perennials in pots — hostas, Shasta daisies, heucheras, astilbe, lady's mantle and daylilies – must go dormant over winter.

Option 1. Leave the planted container in its current location, especially if a large pot which has soil to protect roots, but if it is a dark-colored pot, alternate freezing and thawing may trick the plant into thinking it's spring and trigger early growth, when it's merely a warm day in February.

Option 2. Move borderline-hardy plants or those in small containers to an unheated garage or shed to increase survival odds. It doesn't need light but it will need slight watering every couple of months. Don't overwater. Move back outside in late winter/early spring.

Option 3. Sink the plant and its pot into the ground so the roots will be better insulated. Cover the plant with two to three inches (5 to 8 cm) of winter mulch, such as shredded bark or leaves. In spring, remove the mulch and lift out the container.





Container Gardening Resources



Related MCE Fact Sheets

HG #16- Planting Dates for Vegetable Crops in Maryland

HG #70- Recommended Vegetable Cultivars for Maryland Home Gardens

HG #42- Soil Amendments and Fertilizers Books

HG#600- Container Vegetable Gardening

HG#601- Grow Your Own Greens with Salad Tables™ & Salad Boxes™

Books

“The Edible Container Garden” - Michael Guerra; 2000; Fireside; 159 pp.

“The Bountiful Container” - Rose Marie Nichols McGee and Maggie Stuckey; 2002; Workman Publishing Co., Inc.; 432 pp.

“Container Gardening for Dummies” - Bill Marken; 1998; IDG Books; 334 pp.

“The Contained Garden” - Kenneth Beckett, David Carr, and David Stevens; 1992; Penguin Books; 168 pp.

“Movable Harvests” - Chuck Crandall & Barbara Crandall; 1995; Chapters Publishing; 128 pp.

“Incredible Vegetables from Self-Watering Containers”, 2006; Edwin C. Smith; Storey Pub.; 254 pp.



Container Gardening Resources



Websites

Container Gardens: The City Dwellers Guide to Fresh and Healthy Home Grown Food – www.arts4all.com/elca (interesting plans for wading pool gardens)

The Growing Connection - www.thegrowingconnection.org

A world youth gardening program run by the Food and Agricultural Organization of the UN that uses the EarthBox.

Supplies

Home Harvest Garden Supply Inc. - www.homeharvest.com

Windowbox.com - www.windowbox.com

Gardener's Supply Company - www.gardeners.com

EarthBox™ - www.earthbox.com

Seeds for container gardening- www.containerseeds.com

DripWorks - www.dripworksusa.com

Resources



- **Grow It! Eat It!**

<http://www.extension.umd.edu/growit>

- We have all types of practical food gardening tips and information. Check out our popular blog!

- **Home and Garden Information Center**

<http://www.extension.umd.edu/hgic>

- Here you will find factsheets, photos, and videos. You can also subscribe to the free monthly e-newsletter.
- We answer gardening questions 24/7...just click “Ask Maryland’s Garden Experts”

- **Maryland Master Gardener Program**

<http://www.extension.umd.edu/mg>

- Consider becoming a trained MG volunteer!



UNIVERSITY OF
MARYLAND
EXTENSION

Solutions in your community



This program was brought to you by the
Maryland Master Gardener Program
Baltimore City
University of Maryland Extension