

UF/IFAS Extension

The Journey to Sustainability Begins with Education





**Organic Vegetable
Container Gardening
Noontime Talks
Phillippi Farmhouse Market**

Robert Kluson

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UF/IFAS Sarasota County Extension**

OUTLINE

- Overview of topics of noontime talks on organic vegetable gardening
- Introduction to organic vegetable gardening
- Basics of organic vegetable container gardening

Topics of Noontime Talks for Organic Vegetable Gardening

- Introduction (Nov 23, 2011)
- Edible Flowers (Dec 7, 2011)
- Container Gardening (Dec 21, 2011) ←
- Worm Composting (Jan 4, 2012)
- Frost Protection (Jan 11, 2012)
- Composting – Part 1 (Jan 25, 2012)
- Transplants (Feb 11, 2012)

Topics of Noontime Talks for Organic Vegetable Gardening

- Composting – Part 2 (Feb 22, 2012)
- Irrigation (March 14, 2012)
- Beneficial Insects (March 28, 2012)
- Companion Planting (April 11, 2012)
- Cover crops (April 22, 2012)

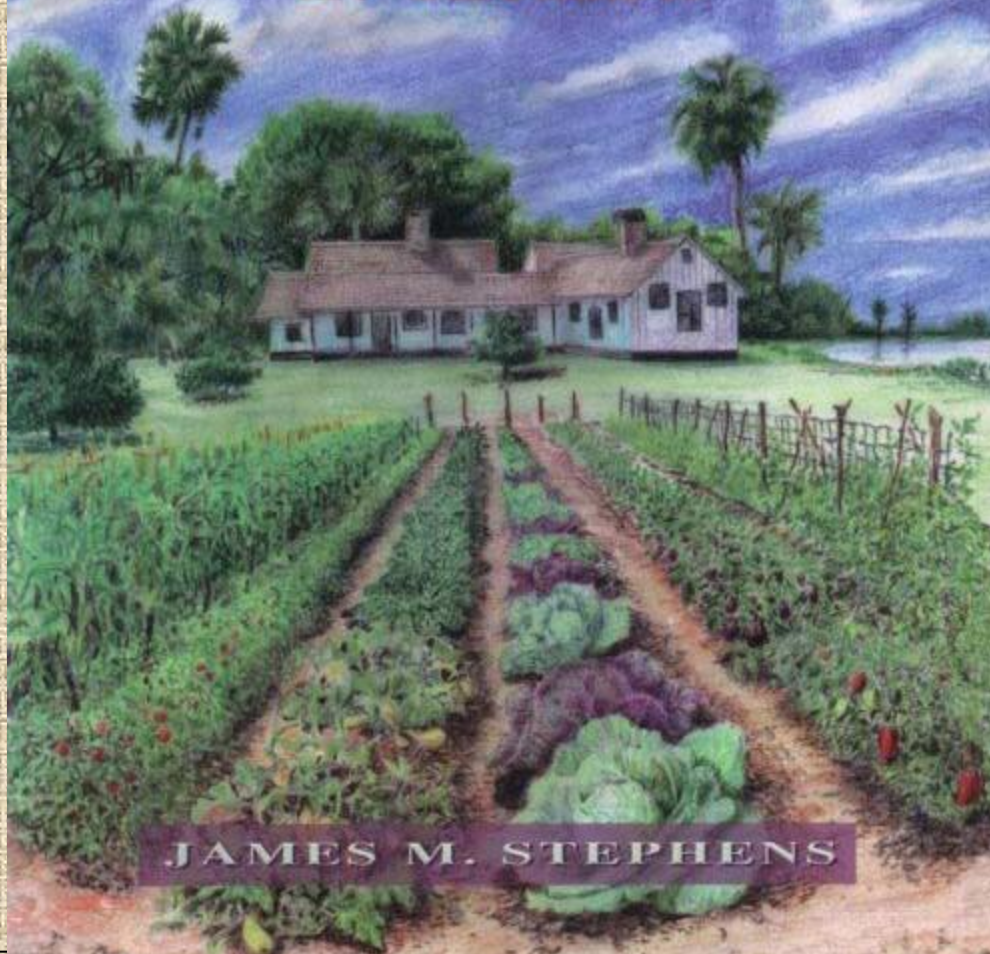
Goals for Noontime Talks on Organic Vegetable Gardening

- Food for your freshest nutrition
- Food for expanding benefits of backyard vegetable gardening
- Food for thought
- Food for your soul

Approach of Noontime Talks on Organic Vegetable Gardening

- Promote the practice of the guidelines in the reference “Vegetable Gardening in Florida” by James M. Stephens. 1999. Univ. of FL, IFAS
- Provide background information on the science and principles from agroecology for successful organic vegetable gardening
- Provide additional resources available for successful organic vegetable gardening

VEGETABLE GARDENING IN FLORIDA



- Available from UF/IFAS bookstore, see <http://ifasbooks.ufl.edu/merchant2/>
Also available from your favorite book vender.

What is Agroecology?

- Recognition of the whole systems nature of food production
- Indicators of agroecosystem sustainability
 - Energy flow
 - Nutrient cycling
 - Population regulation mechanisms
 - Dynamic equilibrium
- Application and management
 - Identify the indicators in each system
 - Observe immediate and future impacts
 - Focus the search for alternatives or solutions to problems

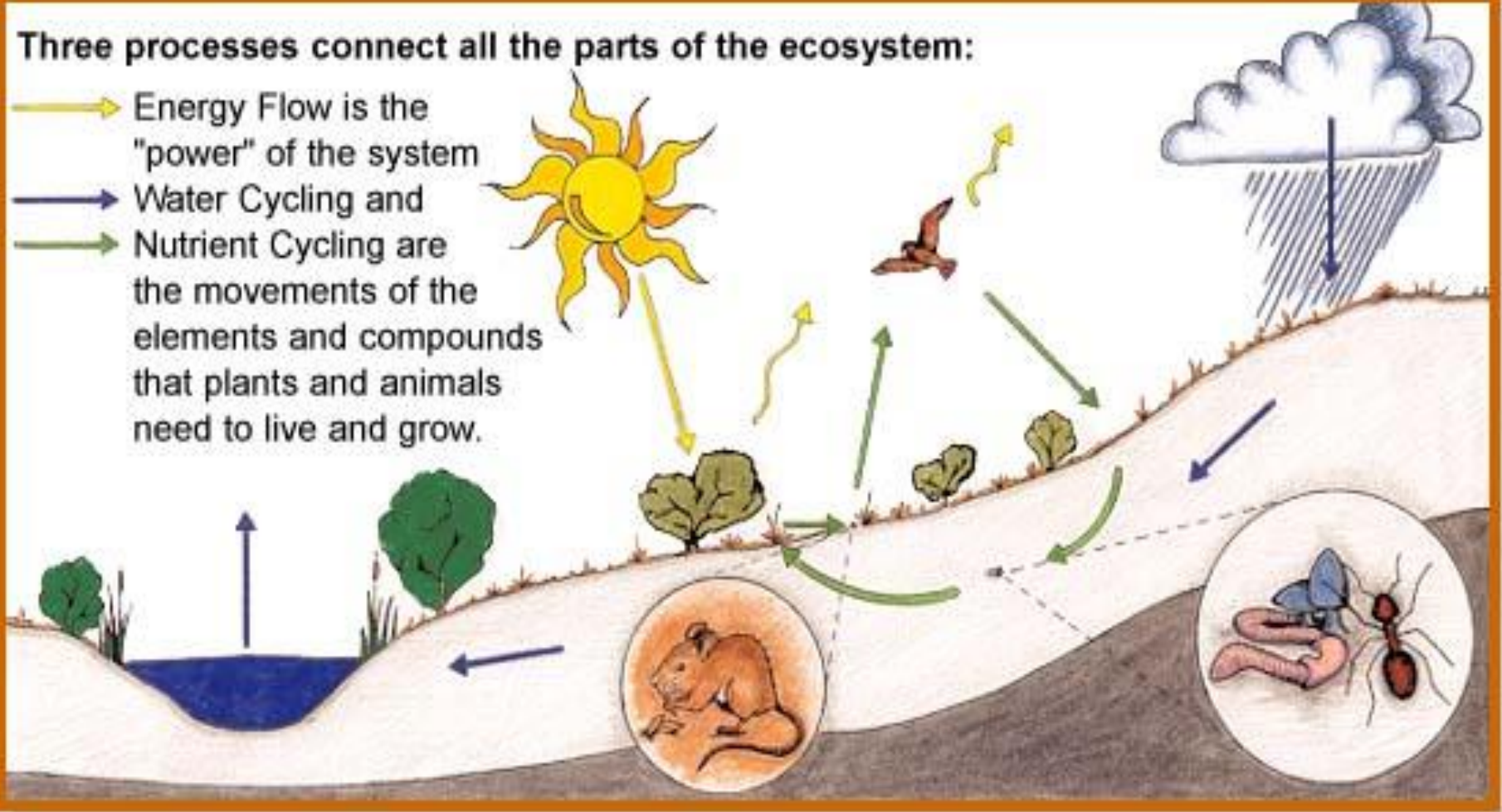
Ecosystems and Plant Growth

ECOSYSTEM PROCESSES

ILLUSTRATION: NICOLE BRAND

Three processes connect all the parts of the ecosystem:

- Energy Flow is the "power" of the system
- Water Cycling and Nutrient Cycling are the movements of the elements and compounds that plants and animals need to live and grow.

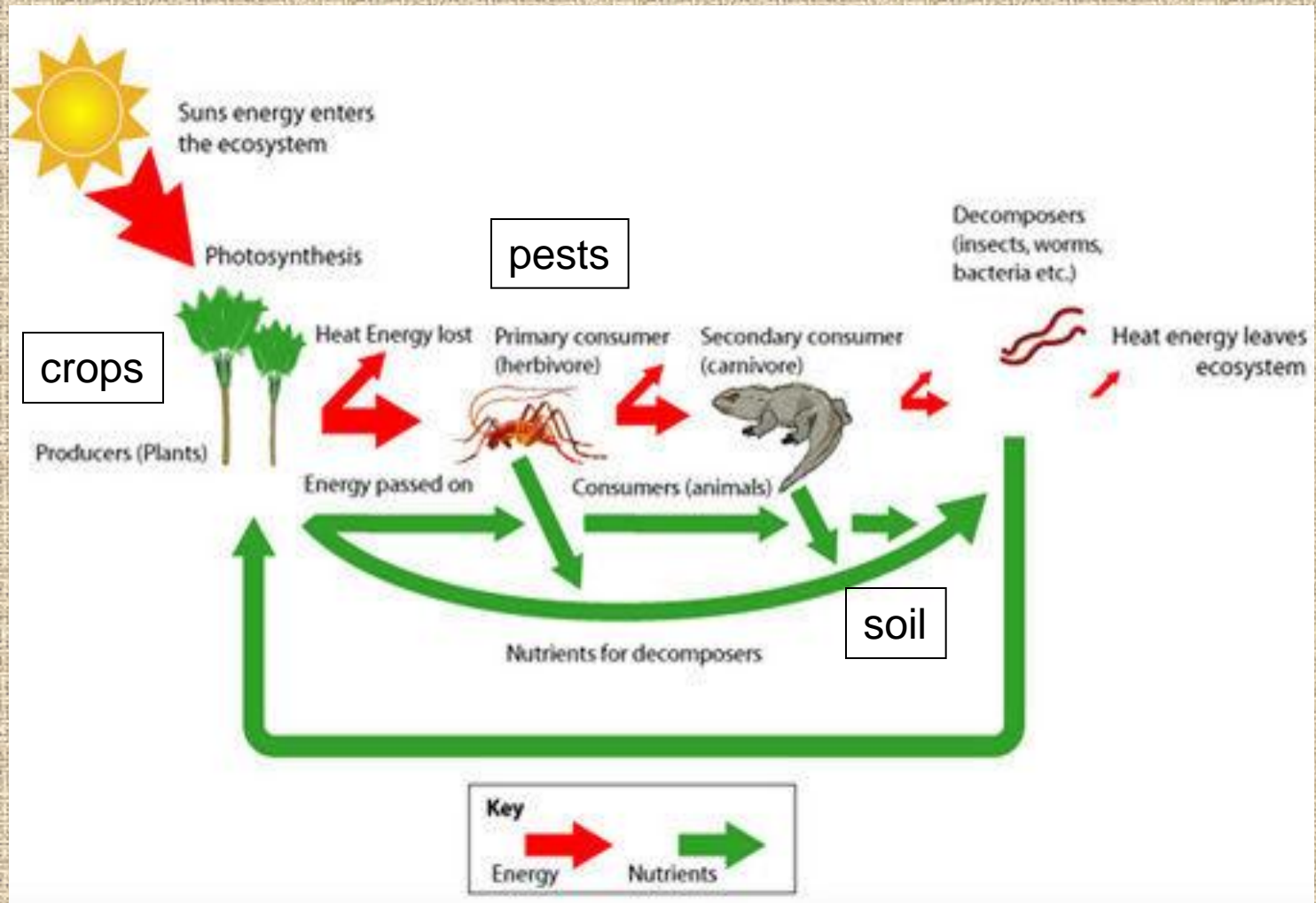


- Our model is the “ecosystem” w/ functional emergent properties & subsystems (e.g., nutrient cycling, etc)

How to Understand a Successful Organic Vegetable Garden Ecosystem



Organic Vegetable Garden Ecology



- Our model for organic vegetable gardening too is promote the “ecosystem” with functional subsystems from managed biodiversity

What Is Organic Vegetable Gardening?



Organic Vegetable Gardening

- A science and art
- Incorporates the entire landscape design and environment to improve and maximize the garden soil's health, structure, & texture
- Maximizes the production and health of developing plants without using synthetic commercial fertilizers, pesticides, or fungicides

David Knauft, Horticulture Department, Univ. of GA

www.caes.uga.edu/extension/clarke/anr/documents/Organicgardening.pdf

Organic Vegetable Gardening

- Differences to "conventional" gardening
 - mainly in the areas of fertilization and pest control
 - use natural and organic materials and methods
 - avoids using practices and synthetic chemicals that may be detrimental to his health or environment.

James Stephens, Horticultural Sciences Department, IFAS, Univ. of FL
<http://edis.ifas.ufl.edu/VH019>

Is This Your Situation?

➤ Your Ability for Organic Vegetable Gardening is Restricted Because:

- ✓ limited space
- ✓ production challenges
 - ✓ inadequate resources (soil, water, etc)
 - ✓ weather
 - ✓ nuisances (pests, animals, people, etc)
 - ✓ contamination
- ✓ physical challenges
- ✓ time constraints
- ✓ home deed restrictions

Container Gardens Offer Solutions

- ✓ Excellent for a small and diverse areas
- ✓ Gardens can be grown inside or outside
- ✓ Plants may be moved as needed
- ✓ Offers endless and creative opportunities
- ✓ Plants that tend to spread are often better grown in a container.

Container Gardens Offer Solutions

- ✓ Soil-borne diseases, nematodes, weeds, and poor soil conditions are easily overcome
- ✓ Easier to maintain for a variety of lifestyles, i.e., less work than a large garden
- ✓ Option for physically challenged persons
- ✓ Very fast results compared to organic field vegetable production
- ✓ Convenient method for edible landscaping

Container Garden Solution Examples



Carport Gardening



Patio/Balcony Gardening

Container Garden Solution Examples

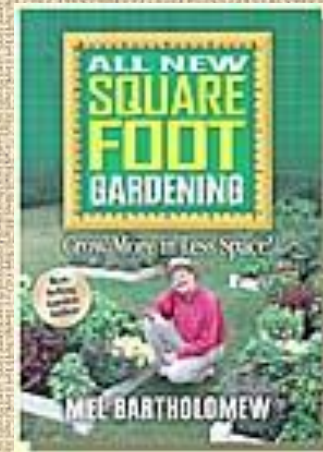
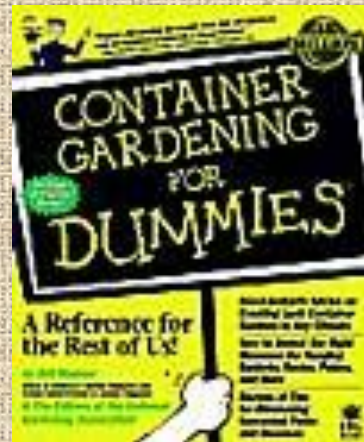


Backyard Gardening



Rooftop Gardening

Container Vegetable Gardening Books



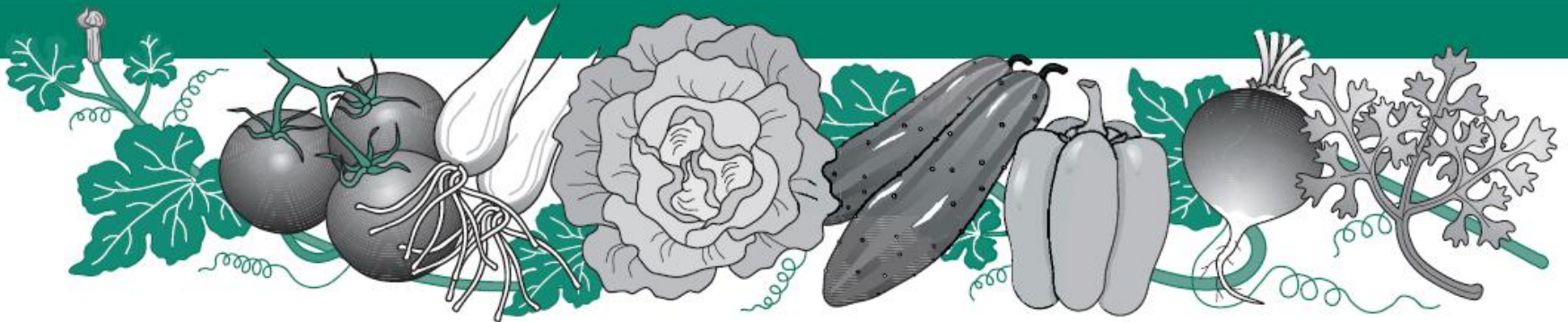
http://journeytoforever.org/garden_con.html

Organic Container Vegetable Gardening: Basics

- ✓ **Crops**
- ✓ **Location**
- ✓ **Containers**
- ✓ **Potting mixture**
- ✓ **Water**
- ✓ **Protection**

Crops: Selection

- Most crops that do well in the backyard will do well in container gardens.
- Those with more compact growth will generally do better.
- Follow UF/IFAS recommendations for cultivars and planting dates
- Crops can be planted as transplants or seed.



Crops: Annuals vs. Biennials vs. Perennials

- **Annuals**
 - Most vegetables, some herbs, many flowers
 - Replanted yearly
- **Biennials** (e.g., beets, cabbage, carrots, celery, onions, parsley, some radishes)
 - 1st year roots/foilage
 - 2nd year flower/seed production
- **Perennials** (e.g., Garlic, shallots, Egyptian onions, asparagus, rhubarb)
 - Come back every year
 - Most herbs and fruit, many flowers, a few vegetables

Location: Important Factors

- Containers can be placed on any level surface—decks, balconies, and along driveways and sidewalks. You can also set them on bare ground and allow the plant roots to grow down into the soil or place them on top of a mulched area. Edibles can also be grown in hanging baskets and window boxes.
- Southern and western exposures will be the sunniest and warmest, while northern and eastern exposures will be shadier and cooler.
- You'll need 6-8 hours of direct sun for warm-season crops (tomato, pepper, eggplant, squash) and 3-5 hours of direct sun for cool-season crops (lettuce, spinach, Asian greens).
- Easy access to water is crucial. Some containers will need watering every day when the weather is hot and dry.
- Consider the microclimate in the container garden area. Watch out for heat sinks created by brick, concrete, and reflective surfaces.

Location: Important Factors

Cautionary notes:

- Containers and the water that drains from them can mark and stain concrete and wood decking. Using self-watering containers or plastic saucers to catch water will prevent this problem (and is very helpful if you are gardening “above” your neighbour’s balcony.)
- The light weight of large plastic containers leads gardeners to believe they can be easily moved. But a 20-inch diameter container filled with moist growing medium and plants can weigh 100 lbs! (You can buy or make plant caddies to make heavy containers portable.)

Containers: You Are Limited Only By Your Imagination !

- Pots
- Wastebaskets
- Aquariums
- Waterproof bushel baskets
- Washtubs
- Hollowed-out logs
- Crates
- Bowls
- Crocks
- Urns
- Tubs
- Barrels
- Cans
- Pans
- Chimney flues
- Baskets
- Cement blocks
- Old pair of work boots

Container Example: Flower Pots



Container Example: Raised Containers



Container Example: Self-Watering Units



EarthBox Units



5 Gallon Bucket Pots

Container Example: Hanging Pots



Decorative
Hanging Posts



Upside Down Tomato Planter



Fence line pots

Container Example: Bags



-'Smart Pots'



Tomatoes in Recycled Shopping Bag



-Trash Bags

Potato
Grow
Bags

Container Example: Vertical Units



Vertical Wall



Growing Column

Container Example: Hydroponics

* An option only for illustrative purposes today



Soilless 'Bottle' Hydroponics



Floating Hydroponics

Container Example: Miscellaneous Containers



Water Bucket



Bath tubs



Barrels



Cartons



Old Boots

Containers: Use Proper Size

Recommended minimum container size
for various plants

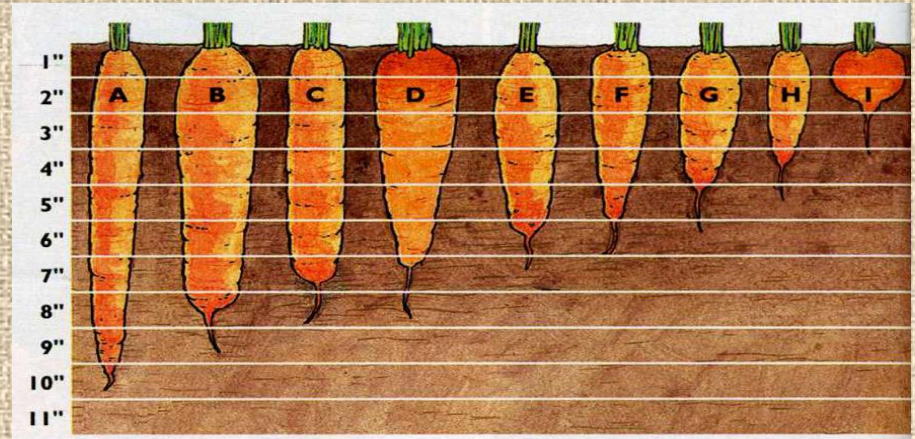
Plants	Hangin g Basket	Small 4"-6" pot	Medium 8"-12" pot	Large >12" pot
VEGETABLES				
Beans (bush)				
Beans (pole)				
Beets				
Broccoli				
Cabbage				
Carrots				
Cauliflower				
Corn				
Cucumbers				
Eggplant				
Lettuce				
Melons				
Onions				
Peas				
Peppers				
Radishes				
Spinach				
Squash				
Swiss Chard				
Tomato				
Cherry Tomato				
Turnips				
HERBS				
Basil				
Chives				
Dill				
Lavender				
Mint				
Parsley				
Rosemary				
Sage				
Summer Savory				
Winter Savory				

Eric de Long, Cornell Extension

Containers: Use Proper Size



- If put in smaller containers first, then move up as plant gets larger



- All varieties are not created equal. Use the books, the Internet and seed catalogs to choose varieties suitable for containers in your location.

Containers: Use Proper Size

Vegetables	Container Size
Beans, Lima	12" wide, 8-10" deep
Beans, Snap	8" wide, 8-10" deep
Beets	6"-12" deep
Broccoli	20" deep
Brussels Sprouts	12" wide, 12" deep
Cabbage	8"-10" wide, 12" deep
Carrots	10" wide, 10" deep
Chard	8-12" deep
Chinese Cabbage	20" deep
Collards	12" deep
Corn	21" wide, 8" deep. Need 3 plants per container to assure pollination.
Cucumber	20" wide, 16" deep

Demboski &
Swanberg.
OSU Extension

Containers: Use Proper Size

Eggplant	16" deep
Horseradish	5 gallon or larger
Kale	8" wide, 8" deep
Kohlrabi	12" deep
Lettuce	8" wide, 6-8" deep
Onion	10-12" deep
Peas	12" deep
Peppers	16" deep
Potatoes	1-20 gallon containers
Pumpkins	5 gallon tub
Radish	4-6" deep
Spinach	4-6" deep
Squash, Summer	24" deep
Squash, Winter	24" deep
Tomatoes	Dwarf—12" deep Standard—24" deep
Turnips	10-12" deep

Demboski &
Swanberg.
OSU Extension

Containers: Tips

- Choose a large pot or tub for a mixed planting, one that will offer enough root space for all the plants you want to grow.
- Rootbound plants, which have filled up every square inch of the soil available, dry out rapidly and won't grow well.
- Light-colored containers keep the soil cooler than dark containers which have a drying effect due to greater heat absorption.

Containers: Tips

• Use containers created from natural materials such as clay, & wood, or recycled products like buckets, tin cans, and plastic pails of safest* food grade plastic, i.e.,



• Note that FDA** approved plastics for recycling include the following



• Soil in containers made of porous materials such as terra cotta pots tend to dry out faster.

[*http://www.hdpe-plastic.com/](http://www.hdpe-plastic.com/)

[**http://www.packaginggraphics.net/plastic-recycle-logo-identification.htm](http://www.packaginggraphics.net/plastic-recycle-logo-identification.htm)

Potting Mixture: Important Factors

- Desirable to use a lightweight, porous growing medium
- Must remain loose, drain well, provide nutrients and retain moisture
- All-purpose commercial potting mixes are permitted if without synthetic chemical additives
- Acceptable fertilizers include organic garden fertilizers, compost, fish/sea weed emulsions, and earthworm castings

Potting Mix: Important Factors

- Garden Soil— never use this by itself for container gardens. Soils hold water and nutrients very well and can drown roots growing in a container. Diseases and weed seeds can also be a problem. And soil is heavy which is an advantage if you are trying to anchor top-heavy plants and pots, but a disadvantage if you want to move pots.
- Compost contains all the major and minor nutrients that plants need for good growth. This makes it an excellent substitute for sphagnum peat moss, which has very few nutrients (although it does hold water better than compost). Composting effectively recycles the nutrients from gardens, landscapes, and farms thereby reducing nutrient pollution of waterways. However, fertilizing is still necessary because the nutrients in compost are released slowly and are usually not sufficient for an entire season.

Potting Mixture: Add Beneficial Soil Life



Add Earthworms
For “Vermigardening”

Compost Biota

- Fauna
- Protozoa
- Decomposer microorganisms
 - Bacteria
 - Actinomycetes
 - Fungi



Use ‘Mature Compost’ for
Beneficials Inoculation

Potting Mixture: Recommendation Examples

Some good media mixtures for container vegetables:

- 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

Water

- Irrigation is critical due to reduced soil volumes of containers compared to field vegetable gardens
- Eating quality and yield will be greatly reduced if plants are allowed to wilt due to lack of water
- Watering needs will vary depending on
 - container size
 - ambient temperature
 - sunlight
 - humidity

Water

- Potting mix should be kept moist & not soggy
- Add water slowly until you see it leave out drainage holes of container
- Use a watering can or a nozzle at end of hose that produces a soft stream of water
- Small containers dry out faster than larger containers
- Large, mature plants need more water than small, seedlings and young plants

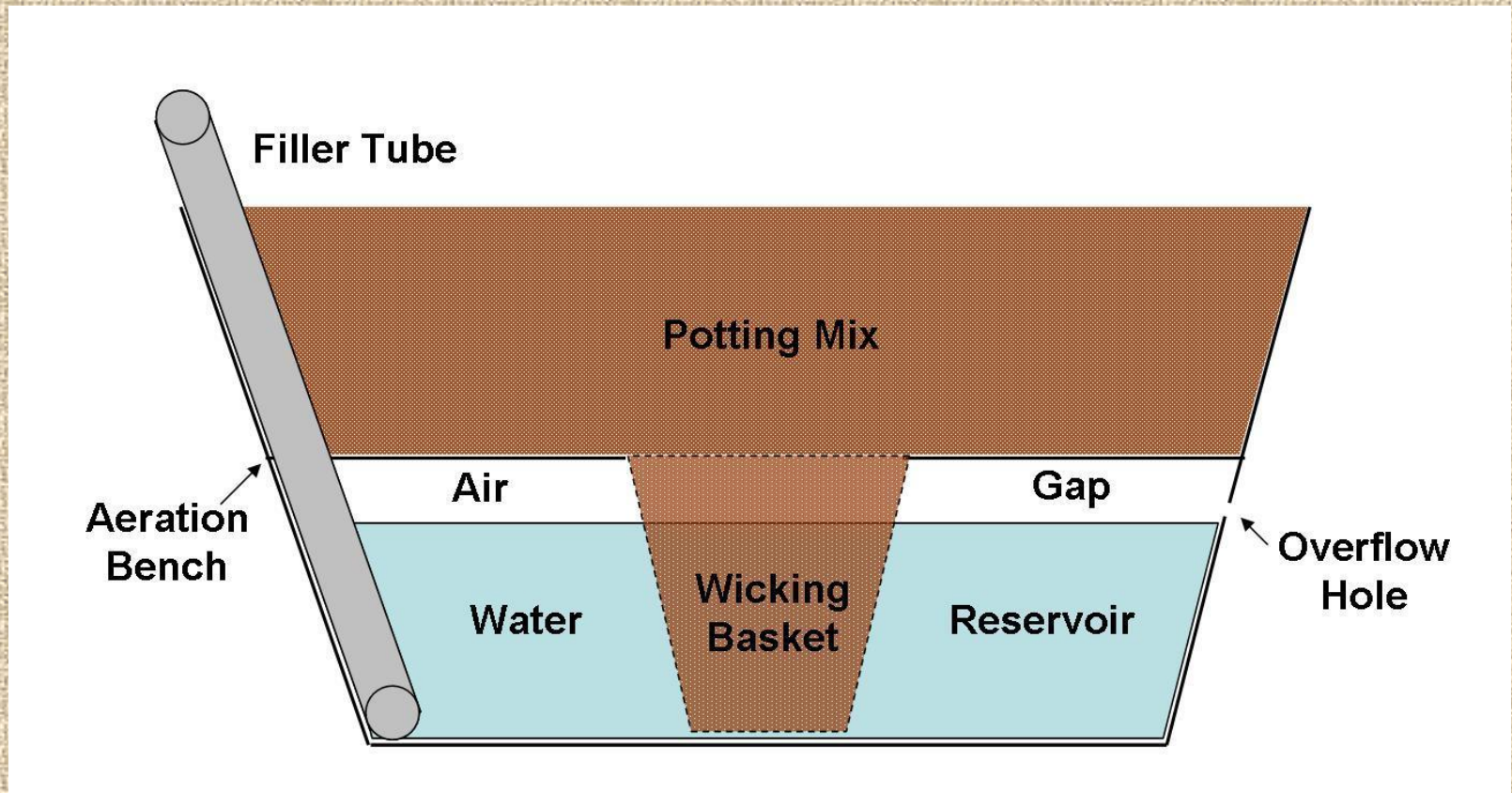
Container Watering Systems

- Micro-irrigation with soaker hoses and drip emitters is efficient, convenient, and relatively Inexpensive.
- Timers can be use for automated watering.



Container Watering Systems

Self-watering containers offers an excellent option of optimal watering



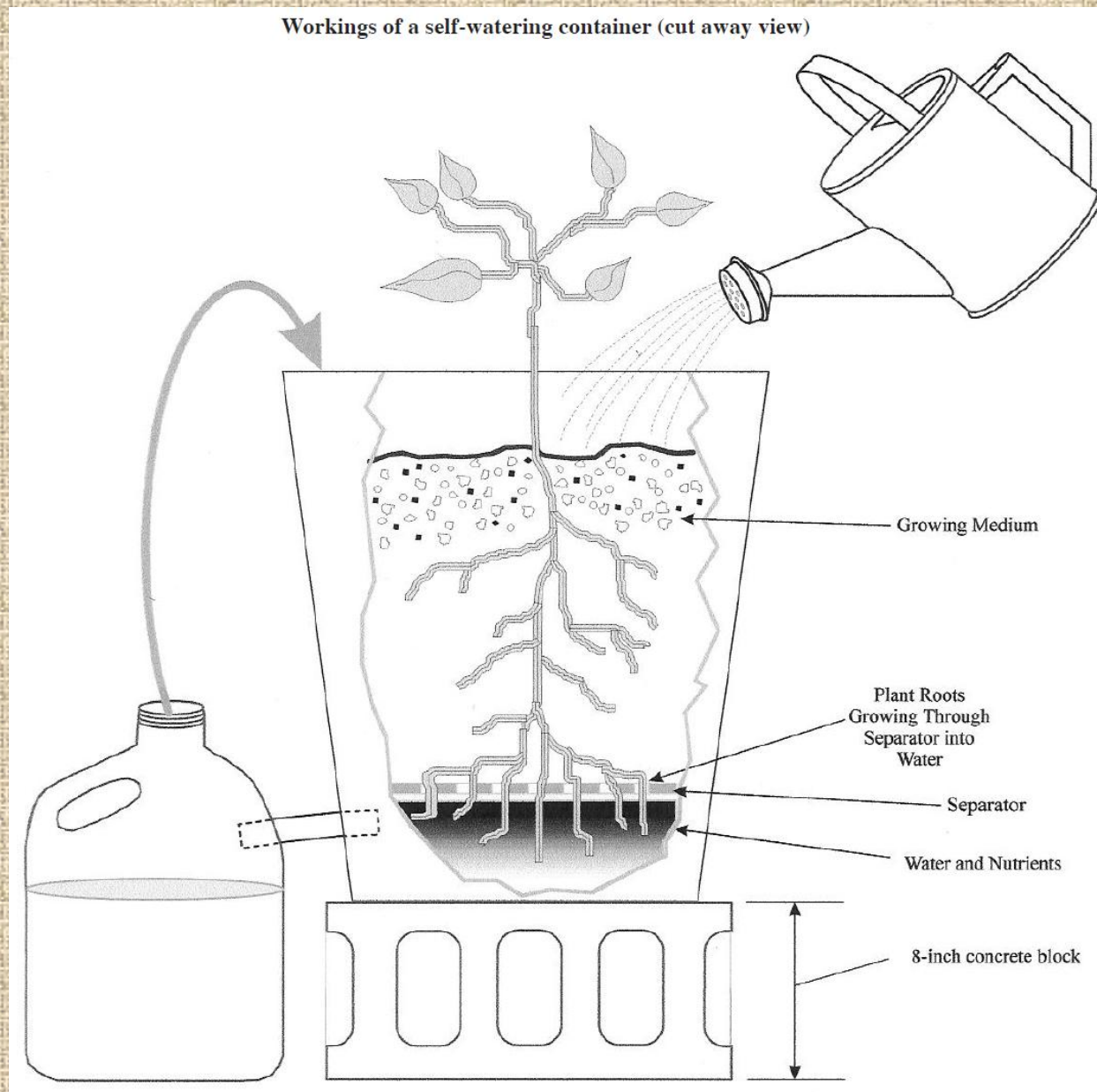
Earthbox™ Design

Water: Self-Watering Container



Homemade Version of Earthbox™ Design

Water: Self-Watering Container



**5
Gallon
Bucket
Version**

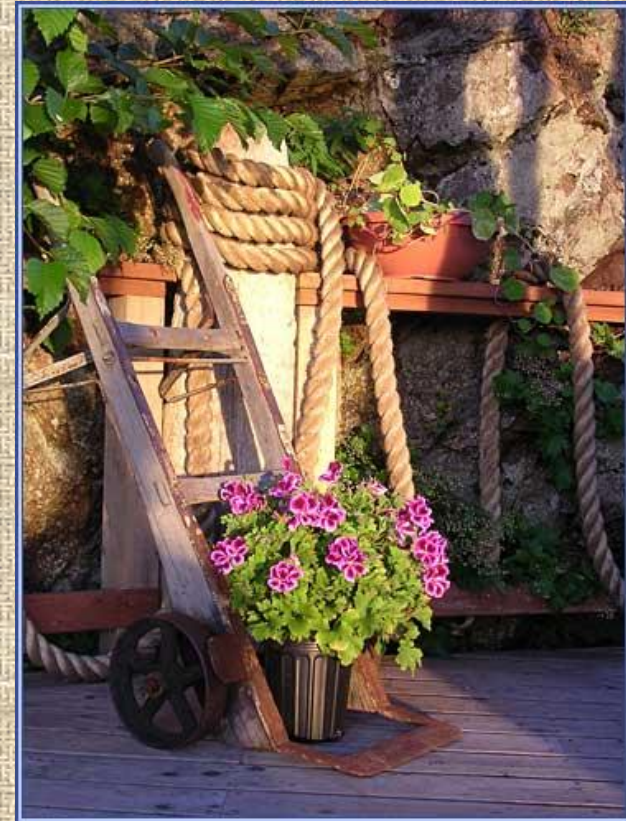
MD
Cooperative
Extension

Container Drainage

- Whatever type of container you use, drainage is very important
- Place drainage holes on bottom or sides
- If located on bottom, container must be elevated to allow drainage of excess water

Protection: Cover or Move from Frost

- Container and roots can freezing during the occasional cold spells.



Protection: Use Companion Planting



Beets & Strawberry Interplanting



Allysum Insectary Plant Container

Container Gardening & Regulations

Are you a container urban farmer?
If so, then certain regulations may apply to you.



Backyard Micro-Farming

Container Gardening & Regulations

Are you a container urban farmer?

Does your gardening look like these examples?



Rooftop Urban Farming

“Food For The Soul”

The Vegetable Garden Poem

For the Garden Of Your Living...

- Plant three rows of Peas:
 1. Peace of mind
 2. Peace of heart
 3. Peace of soul
- Plant four rows of Squash:
 1. Squash gossip
 2. Squash indifference
 3. Squash grumbling
 4. Squash selfishness



“Food For The Soul”

The Vegetable Garden Poem

- Plant four rows of Lettuce:
 1. Lettuce be faithful
 2. Lettuce be kind
 3. Lettuce be patient
 4. Lettuce really love one another
- No garden is without Turnips:
 1. Turnip for meetings
 2. Turnip for service
 3. Turnip to help one another
- To conclude our garden...

“Food For The Soul”

The Vegetable Garden Poem

- To conclude our garden...
 - We must have Thyme:
 1. Thyme for each other
 2. Thyme for family
 3. Thyme for friends
- Water freely with patience and cultivate with love.
- There is much fruit in your Garden because...
 - You Reap, What You Sow!

Author Unknown – see Rocks In My Garden Blog at

<http://rocksinmygarden.blogspot.com/2010/03/i-found-this-poem-over-at-gardeners.html>

Organic Vegetable Container Garden: Enjoy and Good Luck



Online Resources

- Container Vegetable Gardening - see <http://containervegetablegarden.org/>
- De Long, Eric. Growing Vegetable, Herbs and Annual Flowers in Containers. Cornell Univ. Extension – see <http://www.gardening.cornell.edu/factsheets/misc/containers.pdf>
- Jauron, R. & D. Nelsen. Container Vegetable Gardening – see <http://www.extension.iastate.edu/publications/pm870b.pdf>
- Martin, J., K. Demboski, & A. Swanberg. Container Vegetable Gardening. Ohio State University Extension Publication HYG-1647-2000 – see <http://ohioline.osu.edu/hyg-fact/1000/1647.html>

Online Resources

- Maryland Cooperative Extension. Container Vegetable Gardening: Healthy Harvests From Small Spaces – see <http://www.hgic.umd.edu/content/documents/hg600.pdf>
- Organic Gardening Secrets. 2009. Organic Container Gardening – see <http://theorganicgardeningsecrets.com/organic-container-gardening/>
- Santos, B., et.al., 2010. Solutions for Small Farmers and Home Gardens: Building a Low Cost Vertical Soilless System for Small Vegetable and Fruit Crops. UF/IFAS EDIS Publication # HS1186 – see <http://edis.ifas.ufl.edu/hs1186>
- Seattle Peak Oil Awareness Organization. Making a Self Watering Container or Earthbox™ – see <http://www.seattleoil.com/Flyers/Earthbox.pdf>

Online Resources

- Stevens, J.M. 2009. Organic Vegetable Gardening. UF/IFAS EDIS Publication #CIR375 – see <http://edis.ifas.ufl.edu/vh019>
- Stevens, J.M. et.al. 2010. Florida Vegetable Gardening Guide. UF/IFAS EDIS Publication #SP103 - see <http://edis.ifas.ufl.edu/vh021>
- Stevens, J.M. 2010. Minigardening (Growing Vegetable in Containers) UF/IFAS EDIS Publication HS708 – see <http://edis.ifas.ufl.edu/vh032>
- Sweat, M., R.Tyson, & B. Hochmuth. 2009. Building a Floating Hydroponic Garden. UF/IFAS EDIS Publication HS943 – see <http://edis.ifas.ufl.edu/hs184>