

Gardening in Raised Beds



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What is a Raised Bed?

Planting area raised above the existing area that can be of any shape or size usually enclosed with some sort of structure



Are raised beds a new concept?



Reasons to Use Raised Beds

- Maximize gardening space
- Keeps amended soil contained
- Defines space: gives organization and structure



Helps Eliminate Soil Problems



- Drainage
- Poor Soils
- Soil contamination
- Compacted soils
- Alkaline soils

Other Advantages

- Slows down nematode and pest problems
- Could reduce some disease problems due to better drainage



Heats up earlier in spring

- Faster seed germination
 - Warm, well drained soil
- Quicker transplant growth



Beds have higher quality soil



Saves backs and knees

- Easier to maintain
- Easier to harvest
- Less maintenance
- This one is wheel chair accessible
- Florida code requires 5' aisle space for wheelchairs



Raised vs. Traditional Beds



Use a filler in the bottom of deep beds because soil is expensive or build up....drainage important



Elevated Raised Bed



Inside dimensions
46.5" x 46.5" x 7" deep
Cost: ~\$115



How to Build an Elevated Square Foot Garden @ www.ufl.edu
Thralls, Edmund L., Extension Faculty,
Urban Horticulture

Weather shield treated lumber

Drill ¼" hole in middle of each square
for drainage & add fiberglass screening

Ohio State University Study

- Study to evaluate feasibility of growing fruit and vegetables on parking lot
- Raised beds 0.75m or 2' 6" compared to containers and in soil with asphalt removed
- Similar yields for fruit and vegetables as long as adequate soil and water available



Increased Yields

- Dense plantings=higher yields
- Use block planting to maximize space



Ohio Study Comparing Yields

- Traditional home gardens in Ohio yield about 0.6 pounds of vegetables per square foot.
- 3 year study indicates that raised bed produced an average of 1.24 pounds per square foot, more than double

No Soil Compaction

- No walking in the bed
- Can plant even if media is wet
- Minimum tillage
- If bed is too wide, use planks or stepping stones



Can Be Attractive



Adding Hoops to Raised Beds

- Can be constructed with hoops to extend the gardening season
- Regulates moisture if too much rainfall
- Fabric can be added to reduce insect pests
- Shade cloth in heat of summer



Photo by Frank Wertheim



FarmTek
Mini cold
frame

Disadvantages of Raised Beds

- Dry out quickly in hot summer months
- Higher water needs



Disadvantages

- More expensive than in-ground gardens initially
- May not be best option for large family due to expense



Disadvantages

- Limited space for crop rotation
- Increased plant density may lead to more disease problems



Disadvantages

- Sprawling vegetables like watermelons and sweet potatoes
- Tall vegetables (indeterminate tomatoes, corn)
- Vegetables that need to be hilled like potatoes



Add Supports



Informal versus Formal



Student Garden at UNF



BEAM Garden @ Jax Beach



Student Decorator Raised Beds @ FSCJ



Location

- 6 to 8 hours direct sun (for edibles); morning sun important
- Near water source
- Level ground**



Shapes and Sizes

- Shapes vary: rectangle, square, triangle, curves
- Size: suggested width 4', length and height varies
- Minimum depth for good crop growth is 8 to 12 inches. Will crops root into soil below?



Planting box for deep rooted vegetables or for hilling potatoes



Credit: A. Hunsberger



Other
Options
for Creating
Height/Depth



Orientation

- North-south best for low growing crops
- Taller crops east west axis with lower crops on south side



Building Materials

- Stone
- Bricks
- Concrete blocks
- Synthetic/
recycled
materials
- Wood



Cement Blocks



- Can make 1 layer high = 8" deep

Credit: Ed Thralls



Credit: A. Hunsberger

Trough system: using coco fiber or composted pine bark









Construction Materials: Wood

- Non treated wood will rot in ~ a year
- ACQ ground contact treated lumber; copper
- Avoid railroad ties or old pressure treated lumber prior to 2004; creosote and arsenic

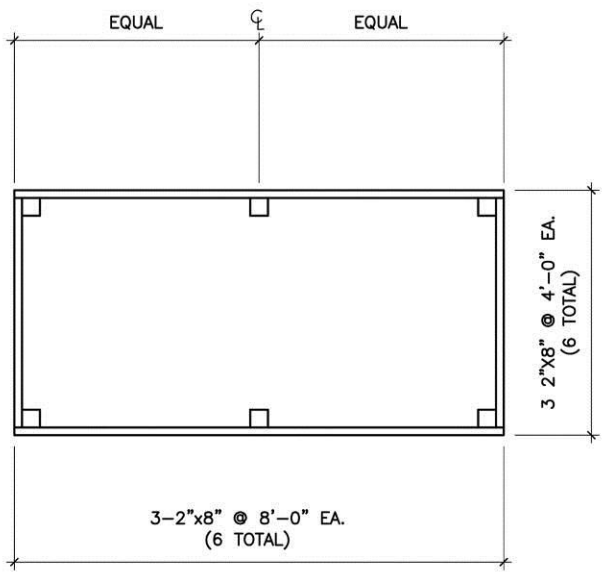
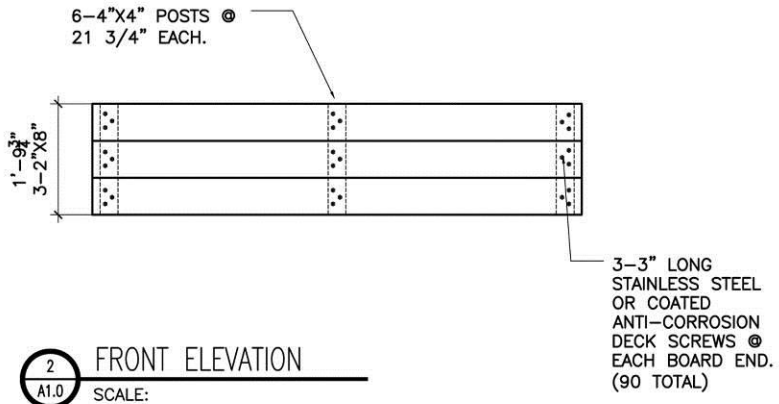


Cedar and redwood are good options but are more expensive

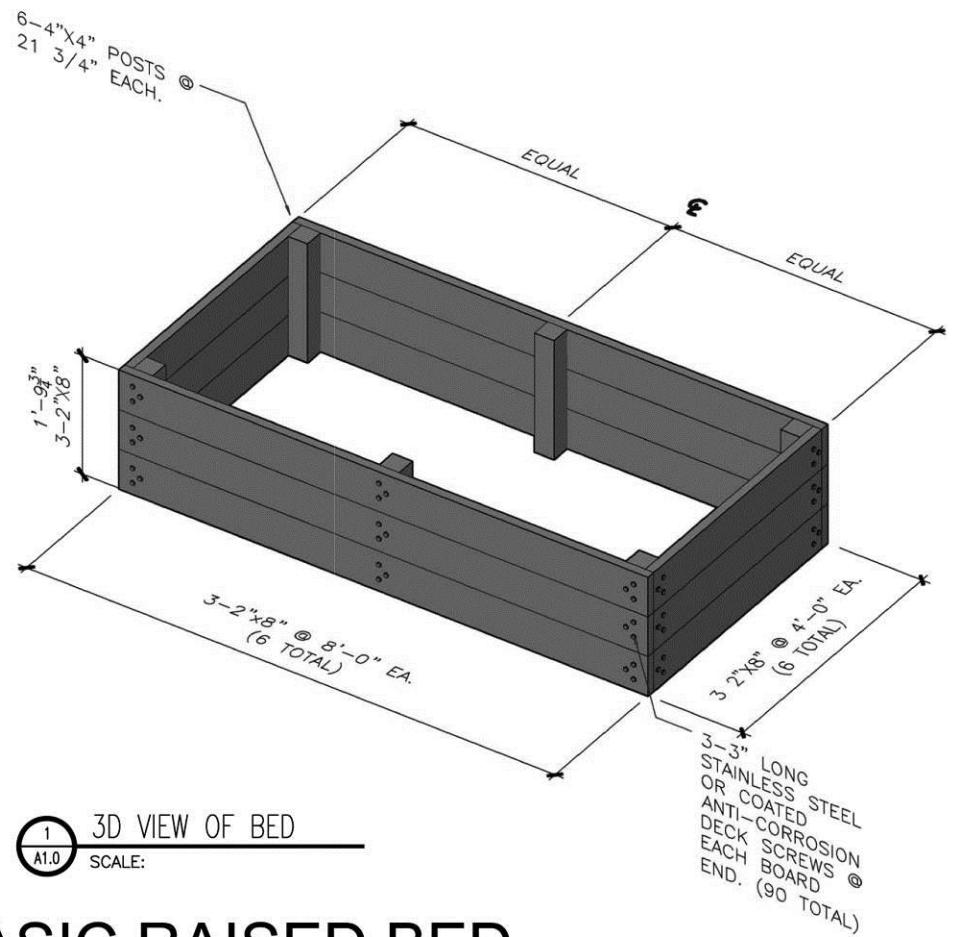
Synthetic Wood

- Made out of recycled plastic
- Will not decay...long lasting
- Available in different finishes/colors
- Downside...more \$\$\$





3 PLAN
A1.0 SCALE:



BASIC RAISED BED

Dimensions up to Individual

- Example: 4 x 8 x 21 $\frac{3}{4}$ " high
- Supplies on page 2 of handout
- Stainless steel deck screws or screws with a coated finish; corrosion resistant



Support Post to Prevent Buckling



Support Posts on Outside



Calculating Media Cost

- Cheapest by cubic yard
- Multiply length x width x height
- Convert height to feet: $21.75''/12'' = 1.81'$
- $8' \times 4' \times 1.81' = 57.92$ cubic feet
- 57.92 cubic feet / $27 = 2.15$ cubic yards



Price per bag: \$3.95
 $\$3.95 \times 58 = \229.10

Price per cubic yard: \$34.75
 $\$34.75 \times 2.15 = \74.71

Costs for 4' x 8' x 21.75" Bed

Item Description	#	Price	Total
2" x 8" x 8' ACQ lumber	9	\$9.97	\$89.73
4" x 4" x 6' ACQ treated posts	2	\$6.77	13.54
3" long coated deck screws; box = 474	90	0.063 ea 29.98/box	\$5.69
Soilless media	2.15 cubic yards	\$34.75	\$74.71
TOTAL COSTS			\$183.67

Costs for 4' x 8' x 14.5" Bed

Item Description	#	Price	Total
2" x 8" x 8' ACQ lumber	6	\$9.97	\$59.82
4" x 4" x 8' ACQ treated posts	1	\$7.57	\$7.57
3" long coated deck screws; box = 474	60	0.063 ea 29.98/box	\$3.79
Soilless media	1.43 cubic yards	\$34.75	\$49.69
TOTAL COSTS			\$120.87

Synthetic Wood Durable

- 4' x 8' x 11" tall
- Composite:
\$38.88 for 0.9" x 5.5" x 16'
- Total using composite wood = \$162.75 (only 1 cubic yard of soil)



Composite wood 0.9" x 5.5" x 16'
\$38.88 x 3 = \$116.64

Construction Tips

- What's underneath?
- Turf, weeds?
- Cardboard or multiple layers of newspaper; wet before adding media



Photo credits:
Jim DeValerio (top)
A. Hunsberger (bottom)

Walkways

- Minimum of 18" to 24"
- For handicapped access 5'
- Mulch or use pavers; depends on users





Good Lightweight Soilless Mix

- Make your own
 - Well rotted compost
 - Composted pine bark
 - Composted manures
 - Peat moss
 - Perlite
 - Vermiculite
- Premade mixes



Homemade mix: will need to adjust pH

Photo credit: A. Hunsberger

Things to Avoid

- Non composted manures
- Manures from meat eaters
- Large bark material
- Native soils
- Compost that contains chemicals, diseases or weed seeds



Fertilizers

- Mix a 6-6-6 or 10-10-10 or balanced slow release fertilizer into top 6" of soil
- Rate determined by analysis and square feet of surface area: refer to fertilizer bag



Mulch

- Use an organic mulch to conserve water and reduce weed problems
- Seeds: wait until plants are up and established



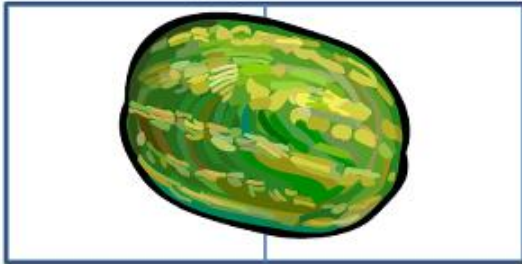
Square Foot or Block Style Layout



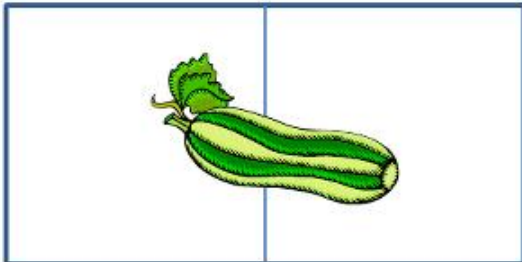
XL

1 plant per 2 square feet

Watermelon



Zucchini squash



Pumpkin



Melon

Winter squash

Summer squash

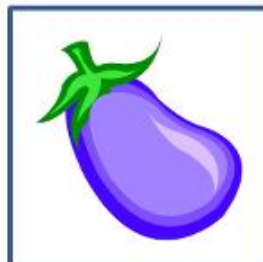
L

1 plant

Tomato



Eggplant



Broccoli



Cabbage

Cauliflower

Cucumber

Okra

Pepper

M

4 plants

Lettuce



Basil



Marigold



Corn

Parsley

Potato

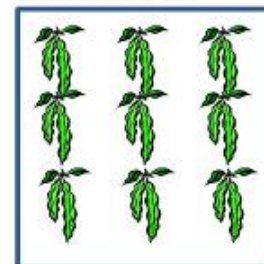
Strawberry

Turnip

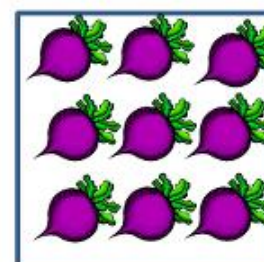
S

9 plants

Bush bean



Beet



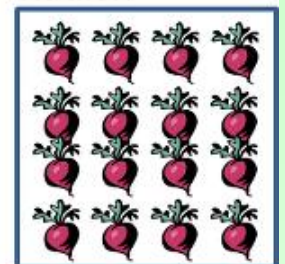
Spinach



XS

16 plants

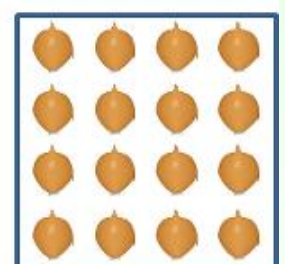
Radish



Carrot



Onions



How many will depend on mature size of plants; varies with varieties



Irrigation Options

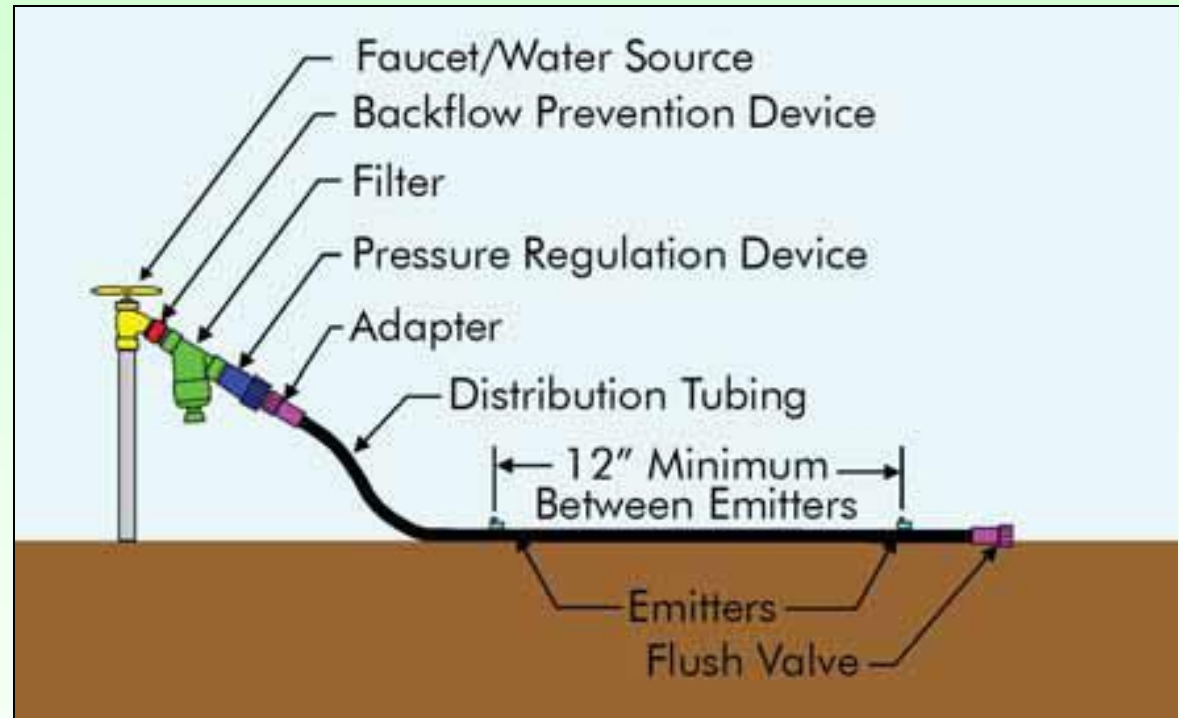


- Water is critical to success
- Avoid overhead sprinklers
- Low volume irrigation
 - Soaker hoses
 - Microspray jets
 - Drip tubing



Parts of a Drip System

- Recommended to filter well or municipal water
- Easily installed on any system except irrigation well or surface water w/o pressure tank
- For emitters keep a small amount of clean backups on hand as they easily clog



Microirrigation – Drip Tape

emitters spaced every 12”



Irrigation Costs

- Varies with bed size and type of system
- Irrigation system in photo was under \$40.00; additional beds under \$10 (based on 100' roll of tube)





**MISTER
LANDSCAPER**

**MISTER
LANDSCAPER**

Current Time AM -
PM -

Start Time AM -
PM -

How Often Hours -
Days -

How Long Minutes -
Hours -

Program Locked ON
Low Battery Line
Manual Water ON

Decrease Increase

Program Set
Manual Off

MLWF-ELEC

100-00000



Maintenance

- Replenish soil at planting time as needed
- Check irrigation system
- Fertilize as needed; fertilize lightly and frequently unless a slow release product used
- Nematode treatment: solarize or replace soil



References

- Terry Brite DeValle, “Gardening in Raised Beds”, ENH1211. May 2013.
- Pete Lane, “Raised Bed Gardening”, HYG-1641-92, Ohio State University
- Adrian Hunsberger and Kathie Roberts, “Building a Raised Bed Garden: The Easy Way”, UF/IFAS Miami-Dade County Extension. September 2010.
- Edmund Thralls, “How to Build a Raised Bed Garden (Concrete Block)”, UF/IFAS Orange County Extension.

Materials for Urban Grow Buckets



- 5 gallon buckets
- Use food grade or new buckets
- 16 ounce plastic cup to be used as the wick cup
- 24 inch long piece of 1 inch PVC pipe

Info from Master Gardener
Kay Robbins

Tools



- Drill
- 3 1/2 inch hole saw
- 1 3/8 inch hole saw or paddle bit
- 1/4 inch drill bit
- PVC cutter or saw

Drill Aeration, Overflow & Wicking Holes



Stack grow buckets & put in front of light source to determine drain hole location

- Drill $\frac{1}{4}$ inch holes in the bottom of planting bucket
- Drill $\frac{1}{4}$ inch holes in the wick cup on the bottom and sides
- Drill several $\frac{1}{4}$ inch holes in one end of fill tube
- Drill at least 2 $\frac{1}{4}$ inch holes in water reservoir bucket

Filling Grow Bucket



Pack the soil in the wick cup



Pack the soil in the bottom 1/3 of the planting bucket

Adding Soil & Fertilizer



Cannot use liquid or time released fertilizer like Osmocote

- Fill the rest of the bucket with soil
- Mound it in the center so that it is domed
- Put granular fertilizer around the outer edge
- Add 1 cup of 8-8-8 or 10-10-10
- Add 2 cups if using organic fertilizer

Plastic Mulch



- Cut a piece of 24 x24 inch plastic
- Make a hole for the fill tube
- Make a hole for plant
- Use the rubber ring from the bucket lid or twine to secure mulch

Cucumbers



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