Gardening in Raised Beds

By Terry Brite DelValle

Duval County Horticulture Extension Agent
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 wheelchair 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
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
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 $$$
BASIC RAISED BED

- 6-4"x4" posts @ 21 3/4" each.
- 3-3" long stainless steel or coated anti-corrosion deck screws @ each board end. (90 total)

Front Elevation:

Plan View:

3D View of Bed:

Scale: A1.0
Dimensions up to Individual

• Example: 4 x 8 x 21 ¾” 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’ x 4’ x 1.81’ = 57.92 cubic feet
- 57.92 cubic feet / 27 = 2.15 cubic yards

Price per bag: $3.95
$3.95 x 58 = $229.10

Price per cubic yard: $34.75
$34.75 x 2.15 = $74.71
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<tr>
<td>Soilless media</td>
<td>2.15 cubic yards</td>
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<td>TOTAL COSTS</td>
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## Costs for 4’ x 8’ x 14.5” Bed

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<td>Soilless media</td>
<td>1.43 cubic yards</td>
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<td>TOTAL COSTS</td>
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<td>$120.87</td>
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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
<table>
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<th>Size</th>
<th>Plants per Square Foot</th>
<th>Examples</th>
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<tbody>
<tr>
<td>XL</td>
<td>1 plant per 2 square feet</td>
<td>Watermelon, Zucchini squash, Pumpkin, Melon, Winter squash, Summer squash</td>
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<tr>
<td>L</td>
<td>1 plant</td>
<td>Tomato, Eggplant, Broccoli</td>
</tr>
<tr>
<td>M</td>
<td>4 plants</td>
<td>Lettuce, Basil, Marigold</td>
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<tr>
<td>S</td>
<td>9 plants</td>
<td>Bush bean, Beet, Spinach</td>
</tr>
<tr>
<td>XS</td>
<td>16 plants</td>
<td>Radish, Carrot, Onions</td>
</tr>
</tbody>
</table>

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)
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

- Pete Lane, “Raised Bed Gardening”, HYG-1641-92, Ohio State University
- 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 ½ inch hole saw
- 1 3/8 inch hole saw or paddle bit
- ¼ inch drill bit
- PVC cutter or saw
Drill Aeration, Overflow & Wicking Holes

- Drill ¼ inch holes in the bottom of planting bucket
- Drill ¼ inch holes in the wick cup on the bottom and sides
- Drill several ¼ inch holes in one end of fill tube
- Drill at least 2 ¼ inch holes in water reservoir bucket

Stack grow buckets & put in front of light source to determine drain hole location
Pack the soil in the wick cup

Pack the soil in the bottom 1/3 of the planting bucket
Adding Soil & Fertilizer

- 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

Cannot use liquid or time released fertilizer like Osmocote
Plastic Mulch

- Cut a piece of 24 x 24 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