Raised Bed Gardening

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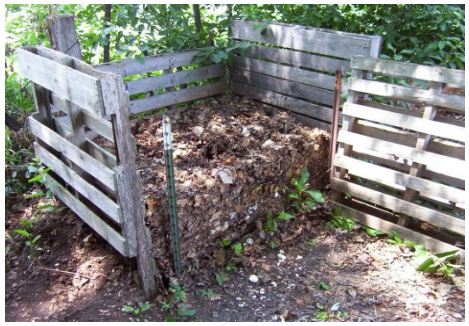
What is Raised Bed Gardening?

- It is gardening in soil beds built up or mounded above the existing ground level.
  - Raising soil level provides a deeper root zone
- Easier to modify the soil structure in the more limited area of the raised bed.
  - Can add mulch, compost, manure, or sand.
- Improved soil structure allows raised beds to be managed more intensively.

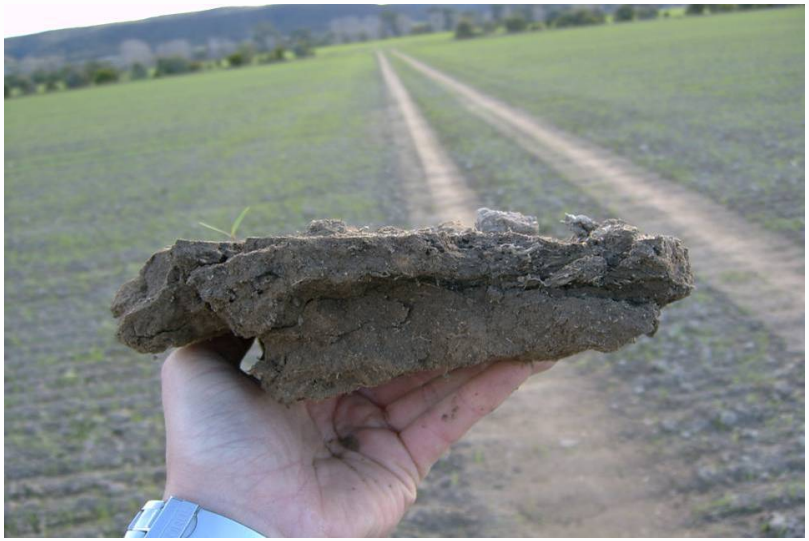
Improvements to Raised Beds

- Incorporate organic matter, use mulch, compost, or manure.
  - This improves soil structure, water holding capacity, and adds soil nutrients



Improvements to Raised Beds

- Improve drainage by adding sand or other large (relative to clay) particle material.
  - Open up compact (clay), poorly drained soils to air and water flow.



Improvements to Raised Beds

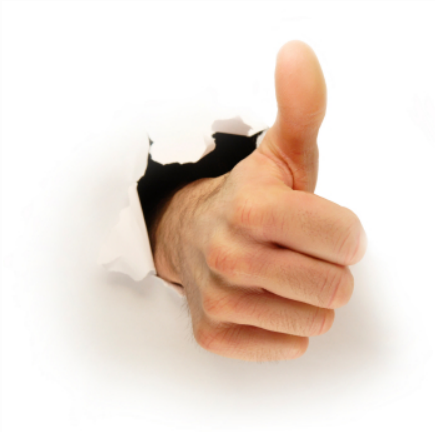
- Properly constructed raised beds create an area of rich soil where none currently exists.

Advantages of Raised Beds

- Longer Growing Season:
  - By improving soil drainage the raised bed dries out faster in wet season.
    - Allows growing crops during rainy season that might not other wise be possible

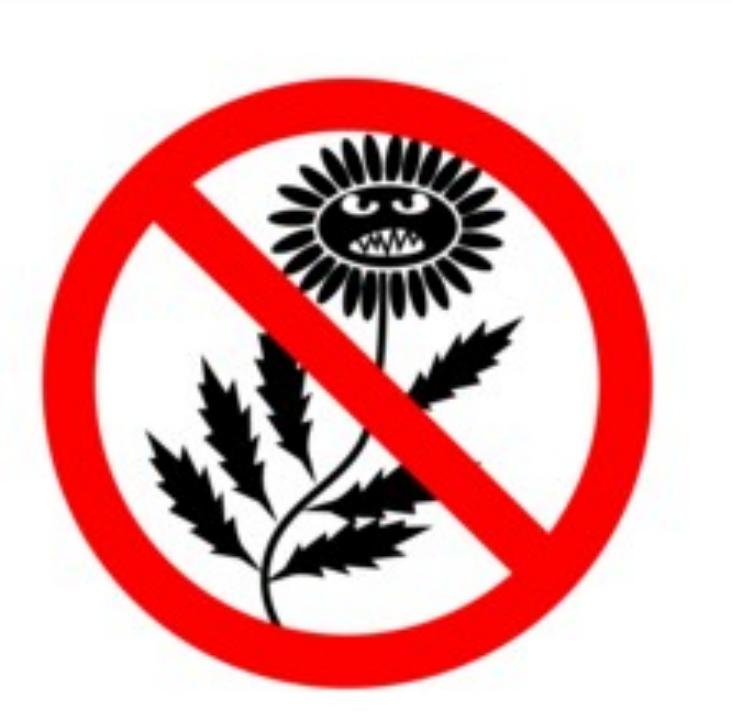
Advantages of Raised Beds

- Higher Yields; Because of improved soil fertility, depth and structure.
  - More plants can be grown in a smaller area.
  - Better root growth with improved structure, depth, plant growth, air, and water



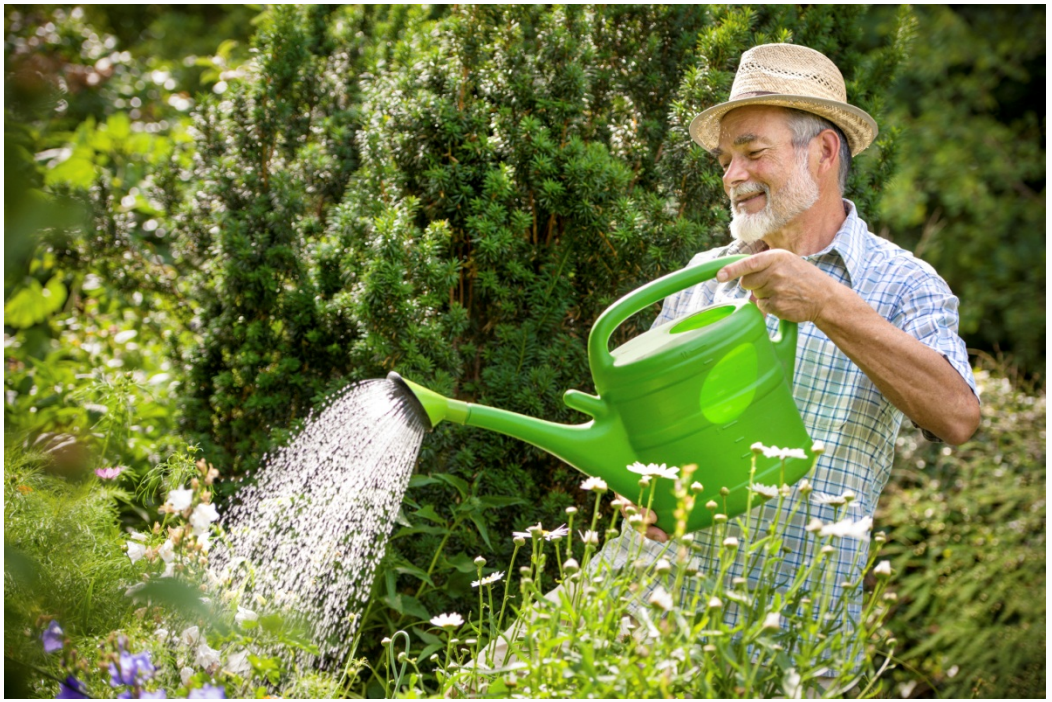
Advantages of Raised Beds

- Maintenance:
  - Planting closer together reduces weed growth by shading out weeds



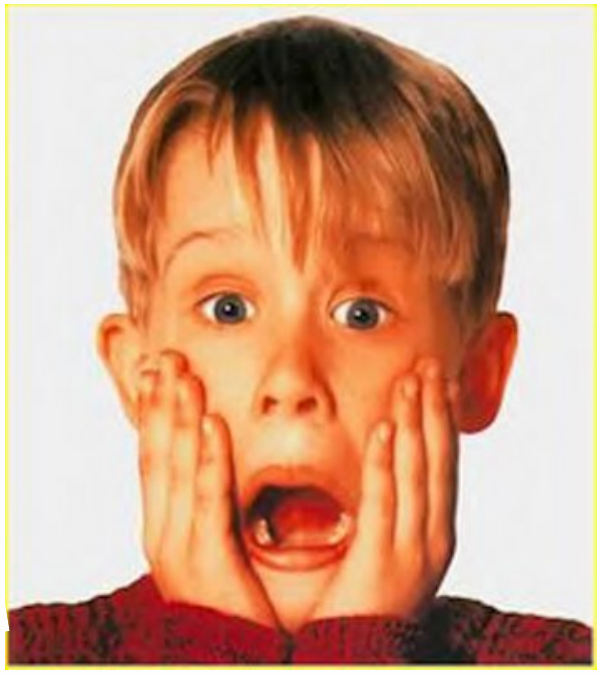
Disadvantages of Raised Beds

- Increased plant density requires more water per unit area.



Disadvantages of Raised Beds

- Can be expensive, if materials have to be purchased.



Disadvantages of Raised Beds

- Increased plant density, may increase pest/ disease concerns.

Designing Your Raised Bed

- Where do you want to put your bed?
  - Good sunlight? Is water near?

Designing Your Raised Bed

- If constructing more than one bed, plan for paths between the beds.

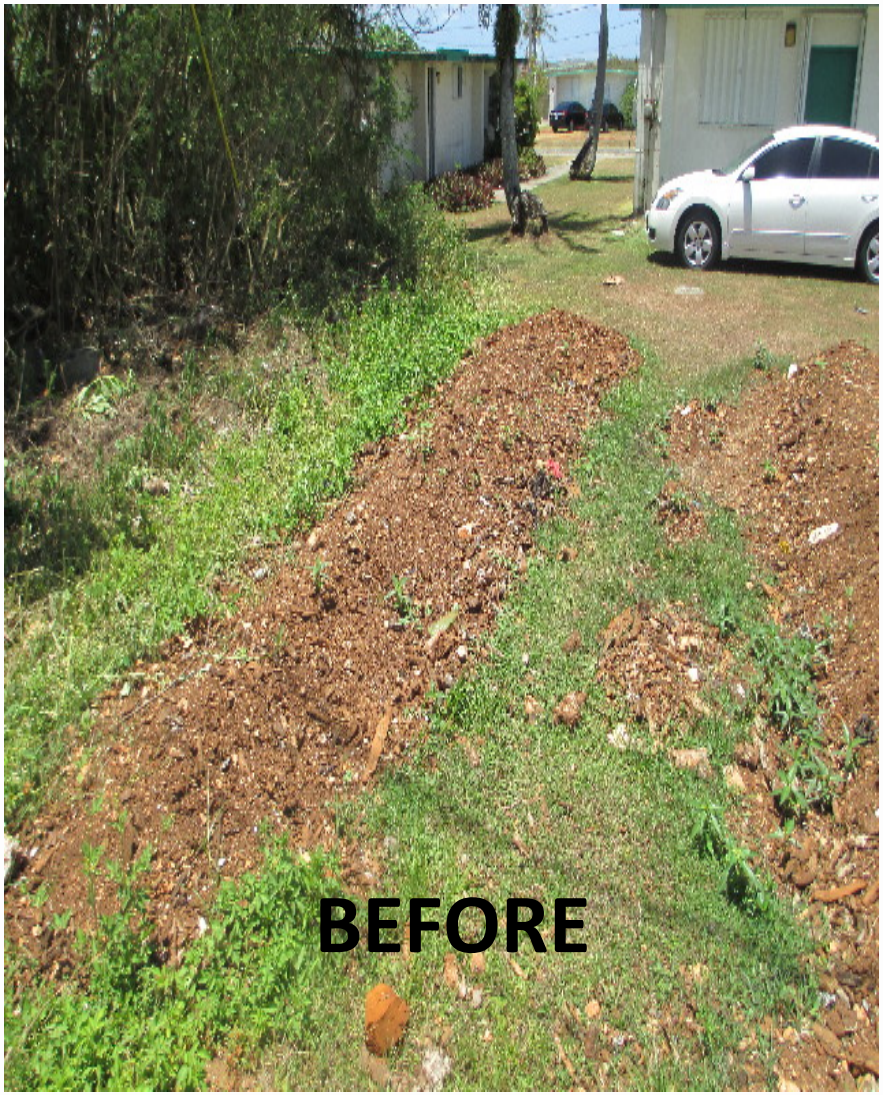
Designing Your Raised Bed

- Mark the dimensions of the bed.

Designing Your Raised Bed

- Do you want temporary or fixed beds?

Temporary Raised Beds/Mounds



Temporary Raised Beds/Mounds

- No frames, so less labor & materials required.
- Beds will flatten over time as the soil settles, and erodes because there is no wall support.
- Dig and turn the soil in a 4-6’ wide area
  - The deeper the better
- Mix soil amendments to the full depth
- Pull soil in from each side of the bed, mounding it up in the center, creating a 3-4’ bed.
- You now have a raised bed with improved soil quality, compared to the surrounding soil.

Fixed Raised Beds

- Have walls that can be built using:
  - Mortared bricks or stones
  - Cement blocks or
  - Rot resistant wood
    - Do not use wood containing creosote or compounds containing pentachlorophenol
    - Organic farmers cannot use treated wood
  - Recycled Tires
- If walls are more than 6-8” they need to be secured (fastened or mortared).

Fixed Raised Beds

Materials Needed For Fixed Beds

- Cinder Blocks, Timber, Recycled Tires or Rock for Walls
- Measuring Tape and Shovels
- Cardboard, News Paper, or Paper Bags
- Sand (WMS Manufacturing Sand) - Optional
- Mulch or Compost,
- Fertilizer or Manure (Chicken or Steer)

Concerns in Building Fixed Raised Beds

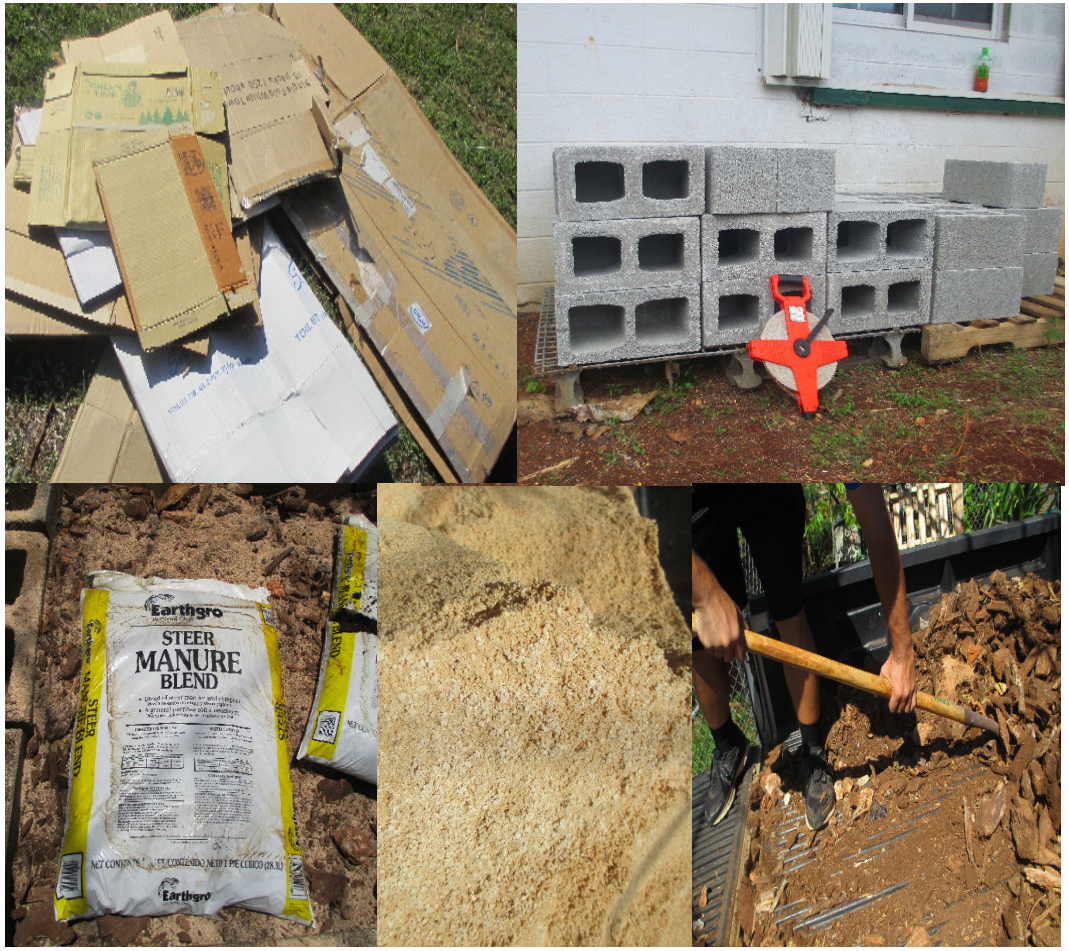
- Beds should be wide enough so you can reach the center from the sides.
  - Arms are only so long, so bed width for adults 4' max, children 3' max.
- Beds should be at least 6" high
  - Plants grow best in 6-12" of soil
- Dig/loosen the soil below the frame,
- Lay down an organic weed barrier or kill weeds before construction
    - Cardboard, newspaper or paper bags
- Add new soil, organic matter or other amendments (leave room at the top for mulch).

Soil Mix

- To loosen clay soils or open air space:
  - Mix up to 1/3 existing soil, 1/3 compost, mulch or peat & 1/3 coarse sand
- In sandy soils, adding organic matter and clay soils will increase water holding capacity in a similar manner.
  - Mix up to 1/3 sandy soil, 1/3 compost, mulch or peat & 1/3 clay or silt.
- Also mix in manure, fertilizer or other materials to increase nutrients.

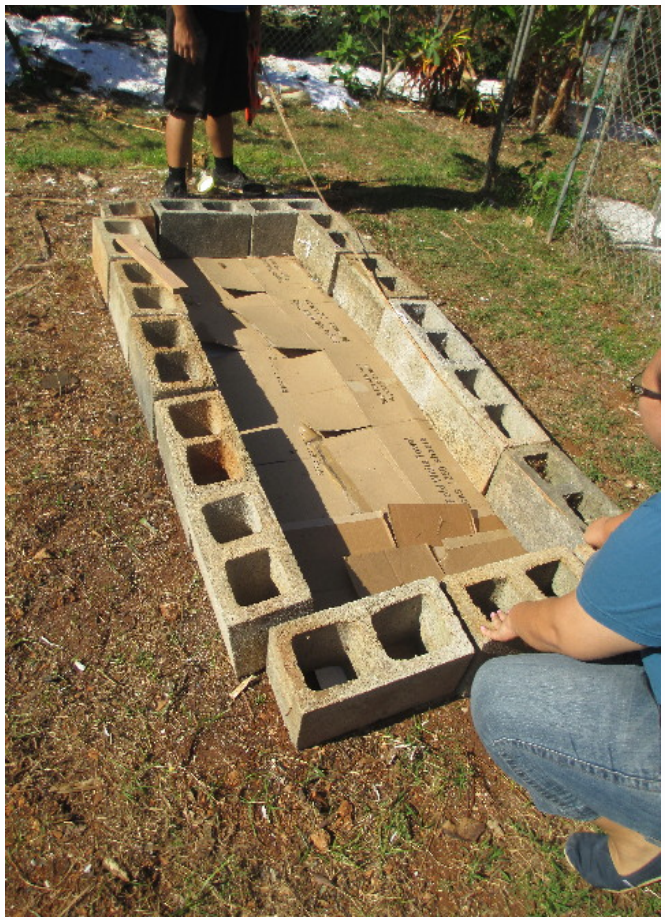
Steps to Making Raised Beds

- Gather Materials
  - Cardboards
  - Blocks
  - Mulch
  - Sand
  - Fertilizer



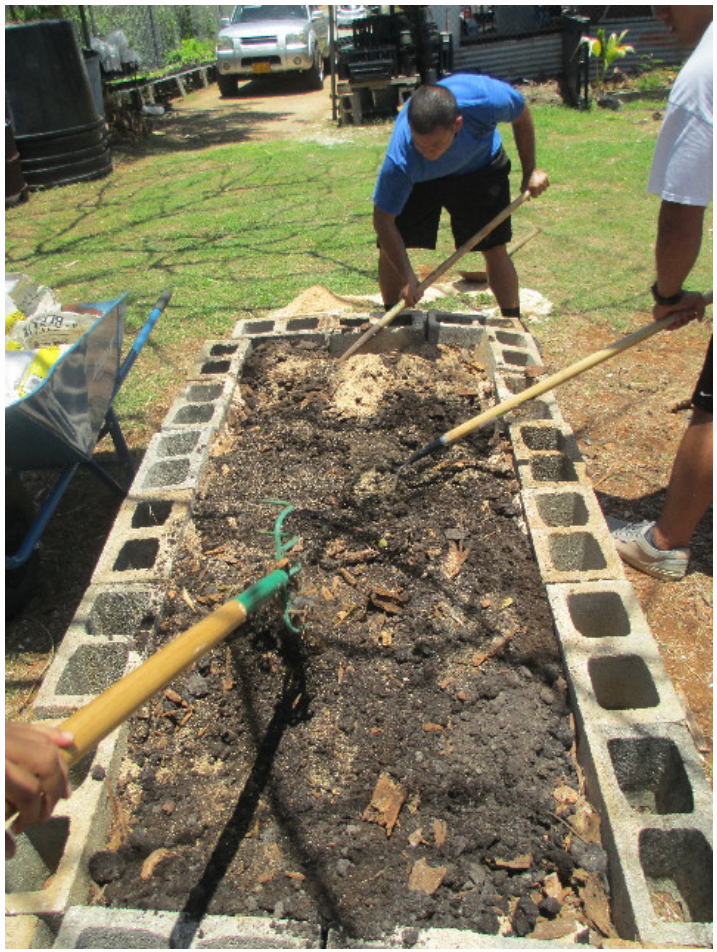
Steps to Making Raised Beds

- Measure desired bed size
  - 3’ x 8’ (Children’s Bed)
  - 4’ x 8’ (Adult’s Bed)
- Level wall base
- Lay cardboard or sheets of paper on top of grass as a weed barrier
  - If weed barrier is thick- need to punch holes
- Place cement blocks over cardboard



Steps to Making Raised Beds

- Fill bed with soil mix
  - Mulch
  - Compost
  - Coarse Sand
  - Existing Soil
  - Manure (Other Organic Matter Sources)
  - Potting Soil



Steps to Making Raised Beds

- Water bed thoroughly before planting
  - Drip Irrigation
  - Sprinkler
  - Hand Watering

Vegetable Spacing in Beds

Crop	Spacing	Days to Harvest
Beans, Yardlong	8”-12”	50-65
Cabbage, Chinese	Up to 6”	45-60
Corn, Sweet	6”-12”	60-70
Cucumber, Climbing	10”-18”	35-50
Eggplant	24”-36”	65-70
Lettuce	Up to 6”	7-35
Okra	24”-36”	40-50

***Leafy greens (Cabbage, Lettuce, & Pechay) can be planted in a continuous strip and harvested to thin them out.**

Vegetable Spacing in Beds

Crop	Spacing	Day to Harvest
Pepper, Sweet (Bell)	18”-36”	50-60
Pepper, Hot	18”-36”	60-70
Pechay	Up to 6”	7-35
Radish (Daikon)	4”-8”	50-60
Squash	24”-48”	50-60
Tomato, Cherry	18”-36”	60-70
Taro	18”	6-8 Months

***Leafy greens (Cabbage, Lettuce, & Pechay) can be planted in a continuous strip and harvested to thin them out.**

Interplanting Spacing Equation

- To determine the spacing for interplanting between different plant species, add the recommended spacing for the two crops to be planted together, and divide their sum by 2.
- For example: Radishes = 2" ; Beans= 4"

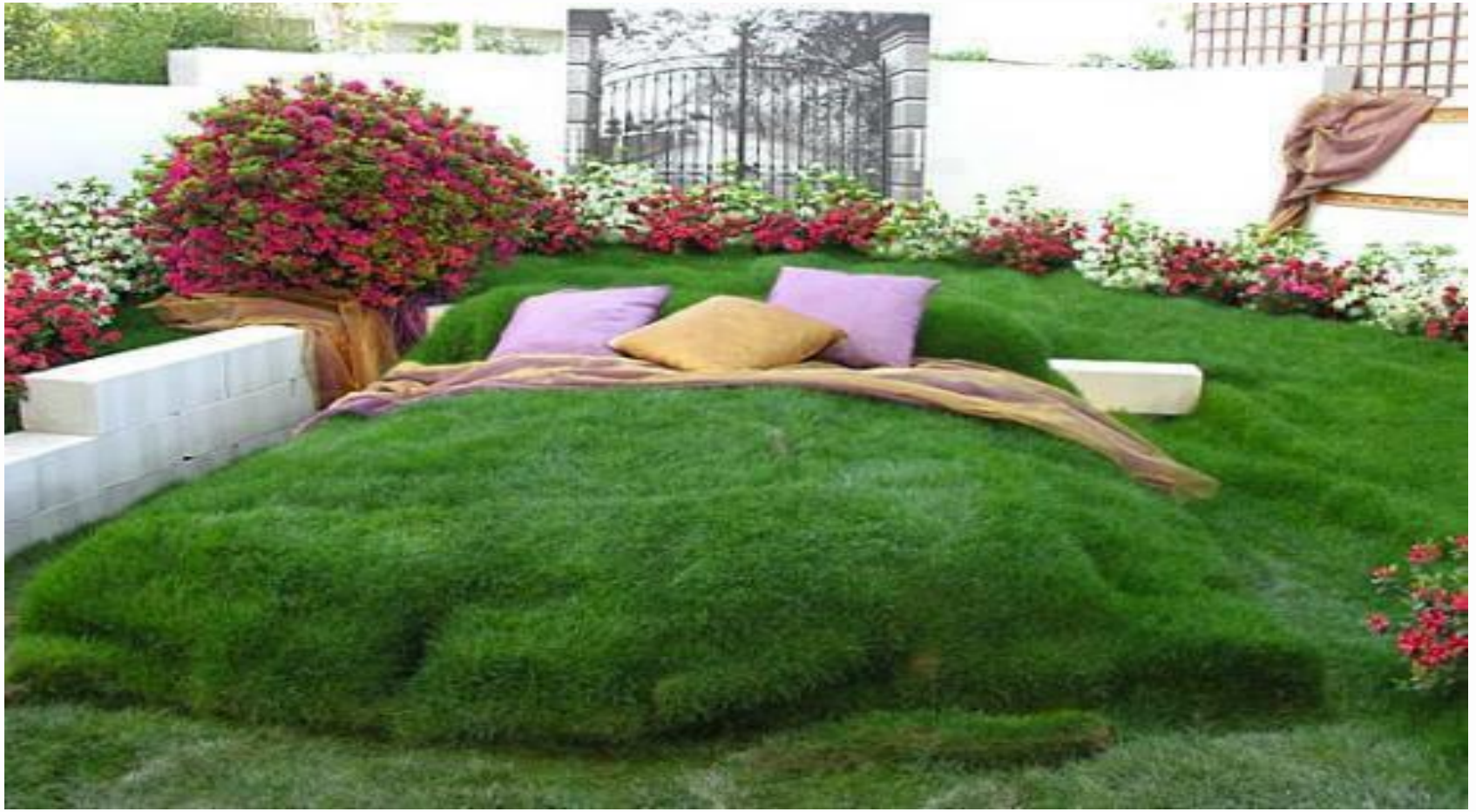
  2" + 4" = 6, then 6" divided by 2 = 3"

  Radishes should be planted 3" from the beans
- Plant your crop, water, lay down a weed suppressing mulch and watch them grow.

Conclusion

- Raised bed possibilities are endless
- Design of raised beds depends on the gardeners resources/goals
- If you invest time needed for construction you can obtain:
  - Better drainage and improved soil structure
  - Increased moisture retention and soil fertility
  - Improved plant growth.

Thank you!



References

Building a Raised Bed Vegetable Garden: The Easy Way, http://miami-dade.ifas.ufl.edu/lawn_and_garden/Building%20a%20Raised%20Bed%20Vegetable%20Garden%20The%20Easy%20way.pdf

Intensive Gardening Methods, http://pubs.ext.vt.edu/426/426-335/426-335_pdf.pdf

Raised Bed Gardening, http://www.aces.edu/pubs/docs/A/ANR-1345/ANR-1345.pdf

Any Questions or Comments:

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