



GARDENING



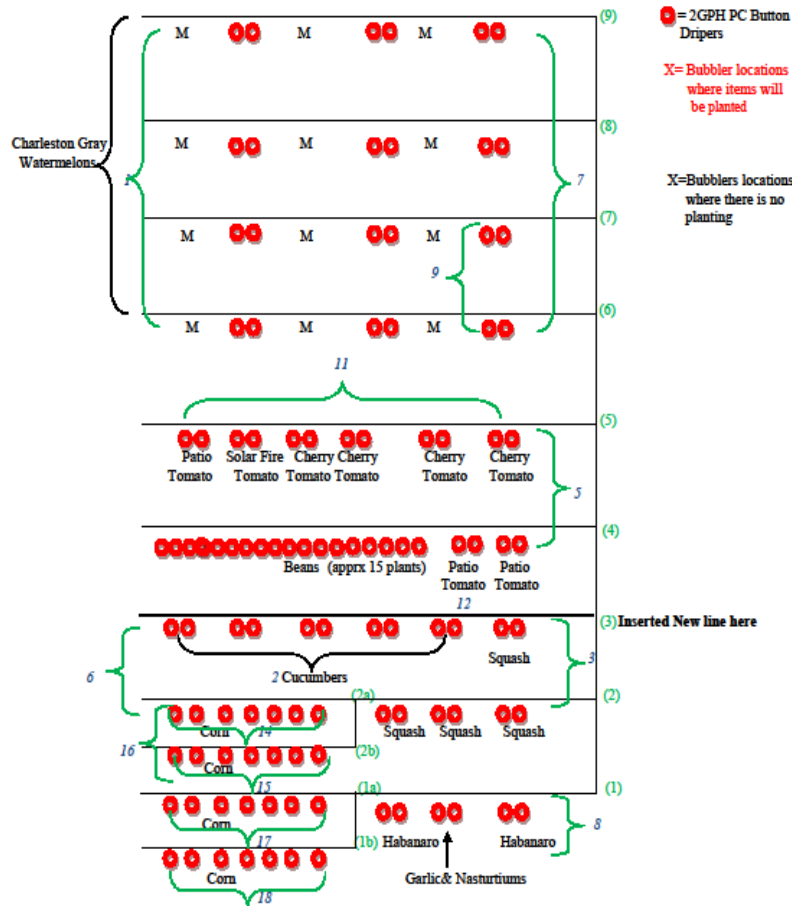
Raised Bed Gardens



Presented by Ron Tanner
University of Arizona Mohave County Cooperative Extension
Kingman Area Master Gardeners

Plan your Garden Layout

Garden 11



Updated 08-13-11

Notes.

- 04-26-11 Companion planted Annual Marigolds(M) (Home Depot) in rows 6-9, holes 2,4,6
- Planted cucumbers Plants from seeds 05-07-11 row 3 holes 2-6. Planted bush pickle (Gurneys #14512) in holes 4,5,6, and bush champion Burpee #50104A in holes 2, and 3
- 05-07-11 Planted squash from seeds in Rows 2 Holes 1,2,3 and row 3, hole 1 Burpee Zucchini #55046A, and Saffron Burpee #62343A. Saffron seeds in hole 3, row 2, and most other plants from seeds. Also companion planted garlic from cloves with Cucumbers and squash 05-07-11. Companioned planted Basil plants with the squash on 05-09-11 apprx 5 plants total.
- Planted Bush beans (Gurneys #73508) apprx 15 plants altogether. 3 plants from seeds and the rest seeds. Also companioned planted Basil (Sea plants and the rest seeds from Home depot) in alternate holes in the Bean row.
- 05-12-11 Planted Patio tomato in row 4, hole 1. Planted Cherry tomatoes in row 5, holes, 1, and 3, and planted Solar Fire tomato in row 5 hole 5. Tomatoes purchased from Home Depot as plants. Companion planted Nasturtiums with all tomatoes. Added stream emitters to all tomatoes and 7 to Beans and one to squash in row 2, hole 3.
- Replanted cucumber seeds in row 3, holes, 2, 4, 6 and replanted saffron squash seeds in row 2, hole 3
- 05-23-11 Rows, 6 and 7 planted Burpee Charleston Gray watermelon seeds (62455A), 2 seeds to a hole, Rows 8 and 9 planted Gurneys Rattlesnake watermelon seeds (15151) three seeds to a hole. Also companion Planted garlic in each each spot.
- 05-24-11 Row 1, Holes 1 and three planted Habanera peppers companion Planted garlic and Nasturtiums in each each hole. Planted garlic and Nasturtiums in Hole 2.
- 06-05-11 Planted rattlesnake and Charleston gray seedlings (2 in row7, hole 1, and 1 in row 8 hole 1) from seeds that I started in the seed starter kit in the shed. I also planted some seeds in the watermelon and cucumber holes that had no plants growing throughout the garden. Finally, I started Charleston grays and rattlesnakes in silver tray on the patio and also started cucumber seeds in the large seed peat pot on the patio
- Planted some random Georgia Rattlesnake water seeds in rows 6-9
- 06-20-11 Planted Cherry tomatoes (grown from Seed) in Holes 2, 4 row 5, and Patio tomato (grown from seed) hole 6, row 5
- Planted patio tomato (grown from seed) Hole 2, row 4 06-21-11
- On the watermelons, squash, cucumbers, beans (interspersed) and habaneros, I added a third adjustable stream emitters for each plant to make sure the plants get enough water. This was done throughout the planting stage.
- 07-14-11 Planted Corn, Sweet, Peaches and Cream Hybrid (Ferry Morse) Home Depot Row 2a. 7 stalks. Companion Planted Dill
- 07-15-11 Planted Corn, Sweet, Peaches and Cream Hybrid (Ferry Morse) Home Depot Row 2b. 7 stalks. Companion Planted Dill
- 08-01-11 Replanted Peaches and Cream Hybrid corn (plants that I started on the patio), the quails ate the ones planted 07-15-11 This time I secured the corn in rows 2a and 2b with cages I made from mesh. Companion Planted Dill
- 08-13-11 Planted Corn, Sweet, Peaches and Cream Hybrid (Ferry Morse) Home Depot Row 1a. 7 stalks. Companion Planted Dill
- 08-13-11 Planted Corn, Sweet, Peaches and Cream Hybrid (Ferry Morse) Home Depot Row 1b. 7 stalks. Companion Planted Dill

Sample Garden Notes Page

Types of Raised Beds

❑ Temporary Raised Beds

○ Advantages:

- No expense in constructing the framework
- Less labor intensive than permanent Beds

○ Disadvantages:

- Flatten over the course of the growing season
- Must be reconstructed the following growing season

❑ Permanent Beds

○ Advantages:

- Last Longer
- Control erosion over the growing season

○ Disadvantages

- Initial Startup cost to create the Beds
- More Labor intensive

Types of Raised Beds



Temporary Garden showing
soil below ground level



Temporary Garden



A grouping of barrels
makes a convenient herb
garden on the patio



Permanent Raised Bed
Garden

Tools Needed



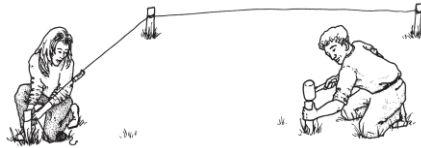
Spade or Spading Fork to turn the soil



Trowel for transplanting and loosening the ground



Rake to smooth out the soil



Yardstick twine and stakes to space rows evenly



Garden Dibble to make holes for transplanting seedlings



Hoe or Hand Hoe to remove tough weeds



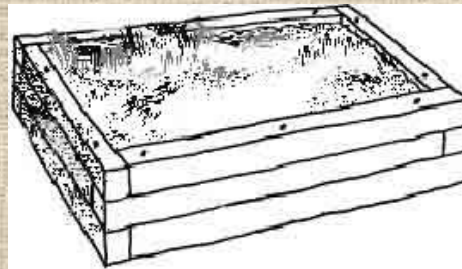
Putty knife for blocking out seedlings or cleaning tools



Duster used to keep insects under control

Preparing the Garden Area

RAISED BED GARDENS



- ☐ Choose a Location that is fairly level
- ☐ Loosen the Ground level soil. Remove rocks and as many clumps as possible
- ☐ In Arizona Soils it is often necessary to *amend* the soil to approximately 16 to 18 inches above ground level for proper root development.
- ☐ Most raised beds are constructed by building large boxes to hold the garden soil so that it is higher than the surrounding ground; but, it is also possible – and sometimes practical – to simply mound up the soil into raised beds without any additional support at all.
- ☐ Level out the soil in the raised bed with a steel garden rake.
- ☐ Let the soil settle.

Preparing the Garden Area-

Continued

- ❑ The raised bed or growing bed is the basic unit of an intensive garden. A system of beds allows the gardener to concentrate soil preparation in small areas, resulting in effective use of soil amendments and creating an ideal environment for vegetable growth. Raised beds warm-up more quickly in the spring.
- ❑ Soil preparation is the key to successful intensive gardening. To grow so close together, plants must have adequate nutrients and water.
- ❑ If your soil is not deep, double-dig the beds for best results. Remove the top 12 inches of soil from the bed. Insert a spade or spading fork into the next 10 to 12 inches of soil and wiggle the handle back and forth to break up compacted layers. Do this every 6 to 8 inches in the bed. Mix the top soil with a generous amount of compost or manure, and return the mixture to the bed. It should be somewhat fluffy and may be raised slightly. To create a true raised bed, take topsoil from the neighboring pathways and mix it in as well.



Efficient Use of Space



❑ Trellising and Staking

- Do not grow horizontally what you can grow vertically. Twining and vining crops such as tomato, squash, cucumber and pole beans can be staked or trellised. This save space compared to letting them grow along the ground.

❑ Spacing

- Use Bush Varieties of beans, cucumbers, melons and squash that require much less space

❑ Succession Planting

- Is sowing seed of a given crop at 1-2 week intervals to produce a continuous supply of vegetables throughout the growing season.

❑ Companion Planting

- Is planting two crops at the same place at the same time. Normally one crop matures and is harvested before the other. Companion planting of insect repellent plant varieties can also help reduce harmful insect infestation.

❑ Intercropping

- Involves planting early maturing crops between the rows of late maturing crops to increase production in a small area.

❑ Proper Spacing

- Proper spacing between rows and within rows is extremely important. However, different spacings may be required in your garden. Different crops can be planted more closely together. Remember the goal is the maximize available space in your raised bed.

Garden Row Spacing

Raised Bed Garden Row Spacing

- ❑ Individual plants are closely spaced in a raised bed or interplanted garden.
- ❑ An equidistant spacing pattern calls for plants to be the same distance from each other within the bed; that is, plant so that the center of one plant is the same distance from plants on all sides of it.
- ❑ In beds of more than two rows, this means that the rows should be staggered so that plants in every other row are between the plants in adjacent rows.
- ❑ The distance recommended for plants within the row on a seed packet is the distance from the center of one plant to the center of the next. This results in an efficient use of space and leaves less area to weed and mulch.
- ❑ The close spacing tends to create a nearly solid leaf canopy, acting as a living mulch, decreasing water loss, and keeping weed problems down.
- ❑ However, plants should not be crowded to the point at which disease problems arise or competition causes stunting. Refer to Table 10.12 for recommended spacing in intensive gardens.

Garden Row Spacing



Recommendations for Row and Plant Spacing in a more traditional Home Garden

Vegetable	Seed or Plants for each 10 ft of Row	Inches between Plants	Inches between Rows
Asparagus	7 crowns	18-24	36-48
Beans, bush	1½ oz.	2-3	24
Beans, lima	1½ oz.	4-6	24
Beans, Pole	1 oz.	4-6	24
Beets	½ packet	2-3	12-18
Broccoli	5-7 plants	18-24	20-28
Cabbage	7-10 plants	18-24	20-28
Carrots	½ packet	2-3	12-18
Cauliflower	5-10 plants	18-24	24-30
Celery	20 plants	6	20-24
Corn, sweet	1 packet	8-12	30-36
Cucumbers	½ packet	15-18	48-60
Eggplant	6-8 plants	18	24-30
Endive	1 packet	6	12
Kale	1 packet	4	12-18
Kohlrabi	½ packet	4-6	15-24
Lettuce (leaf)	1 packet	2-3	12
Muskmelon	1 packet	18-24	48-60
Mustard	1 packet	4	12-18
Okra	¼ oz.	18-24	24-36
Onion seed	1 packet	2-3	12-15
Onion Sets	60 sets	2-3	12-15
Parsley	1 packet	4	12-18
Parsnips	1 packet	3	18-24
Peas	1 ½ oz.	2-3	6-12
Peppers	5-7 plants	18-24	24-30
Potatoes (Irish)	10 pieces	12	24-36
Pumpkins (winter squash)	1-2 hills	4	60-72
Radishes	1 packet	1-2	6-12
Rhubarb	3 crowns	36-72	36-60
Spinach	1 packet	3	12-18
Squash (summer)	½ packet	4	24-30
Swiss chard	8 plants	6-8	15-18
Tomatoes	2-5 plants	24-36	24-48
Turnips	½ packet	2-3	18-24
Watermelons	½ packet	18-24	60-84

Raised Bed Designs



More Raised Beds



Mulch, Mulch, Mulch

- ☐ Mulching can be an alternative to weeding if you have a reliable source of mulching materials.
- ☐ Thick layers of organic mulch will not allow most annual weeds to poke through, and those that do are usually easily pulled.
- ☐ Mulch can also be used to modify soil temperatures. Inorganic mulches (plastic sheeting, weed mats, etc.) warm up the soil, while organic mulches (sawdust, compost, straw, newspaper, grass clippings, etc.) cool the soil.
- ☐ After your soil has settled, you should mulch the top layer. Mulching can be used to control weeds, and also conserves soil moisture.
- ☐ Mulch at least 2 to 4 inches above the ground. Straw, lawn clippings, dried bark, weathered sawdust or other materials can be used
- ☐ Sawdust is not recommended for use right around plants because of its tendency to crust.
- ☐ These materials can be turned into the soil periodically to improve the condition of the soil.
- ☐ I prefer not to use weed cloth, or weed block underneath the mulch because I've observed that my plants are not as healthy with it as without.

Mulch, Mulch, Mulch



To Till or Not to Till

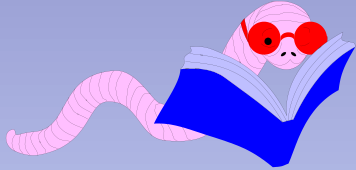


Whether to till your garden soil or not till is an individual decision, but before you begin, consider this.

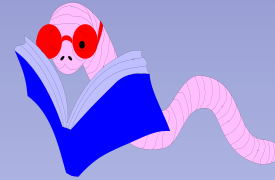
Some issues with tilling:

- ☐ The more soil that gets turned upside down, the larger the number of dormant weed seeds that rise to the surface where they germinate and grow.
- ☐ Deep tilling can spread pathogens and pests
- ☐ Roto-tiller engines are notorious air and noise polluters.
- ☐ Tilling can destroy soil structure

Worms, Worms, I like Worms



Beneficial effects of Earthworms



Earthworms and soil productivity. Numerous investigators have pointed out the beneficial effects of earthworms. Some of these are as follows:

- ❑ They aid in the degradation of organic residues in the soil with the release of elements such as carbon, nitrogen, sulfur, and other nutrients.
- ❑ The action of the digestive fluids and increased microbial activity in the casts (droppings) tends to solubilize inorganic plant nutrient elements present in inorganic soil minerals.
- ❑ The structural stability of ingested soil is improved through increased microbial activity while the soil is within the work and after it has been deposited as casts.
- ❑ The extensive burrowing of the earthworm improves soil aeration and may increase water penetration into soils.
- ❑ Under natural conditions the earthworm will feed on surface organic litter and deposit its casts in the plant root zone. After further microbial decomposition of the partially digested residues, plant nutrient elements are released.

Caveat- Although Some recent studies have suggested that Earthworms may cause damage to young Seedlings, They have worked really well for me.

Temporary Raised bed with Companion Plants





THE END

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