Vertical & Small Space Gardening

"How to get more out of a small space"

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USU Extension - Thanksgiving Point

My Garden

My Garden

Overview

- Concepts of small space gardening
- General gardening concepts
- Vertical space gardening specifics
- Variety/cultivar choices
- Tips and tricks I have learned

Why Small Space Gardening?

- Uses every spare area of your yard
- Less water
- Little waste
- Easily maintained
- Less expensive overall

Keys To Great Gardens

- The big 4
  - Soil, light, water, fertilizer
- Grow what you use
- Record and improve

- Remember, if it doesn't work, it's "research" ☺

A Few Definitions…

- Small Space ≠ Container Gardening
- Box gardening = Container Gardening
  (For today's discussion)
- Soil, water, fertilizer needs are dependent on type of gardening

My Soapbox About Soil…

Soil…Box/Container vs. Regular Soil

Box Garden Soil

- Must be soil-less or close to soil-less
- Will require more water
- Easier to weed
- Must fertilize regularly
- Earlier planting in spring (dries out)

Regular Garden Soil

- Must amend yearly, need to create silt
- Holds more water (usually)
- Needs less fertilizer
- Amend, amend, amend
- Stronger for taller plants

Making The Soil – Box Gardens/Containers

There are several mixtures you can use for box gardening:

- 1/3 sand + sawdust + 1/3 peat moss
- 1/3 sand loam soil + 1/3 vermiculite + 1/3 peat
- 1/3 peat moss + 1/3 vermiculite + 1/3 compost
- Many other mixtures
- The key: too much actual soil = hardened concrete

Box Garden Prep

- Layer on top of loosened soil, mix
- Dampen and let settle and mix again
- Add fertilizer
- Level your soil a little higher than your frames, wet and wait a day before planting (settling)

Soil Needs – Regular Garden Soil

How do you determine your soil needs and type?

- Send a soil sample to the USU Analytical Lab (more in-depth soil analysis)

  USU Analytical Lab
  Ag Science Rm 166
  Logan, UT 84322-4830

- Use glass jar method

Jar Method

First,

- Take soil sample
- Remove rocks
- Remove organic matter
- Sift

*Picture from finegardening.com

Jar Method

Second,

- 1 ½ cups in 2 quart jar
- 1 TBLS detergent (optional)
- 1 ½ cups water
- Tighten lid

Jar Method

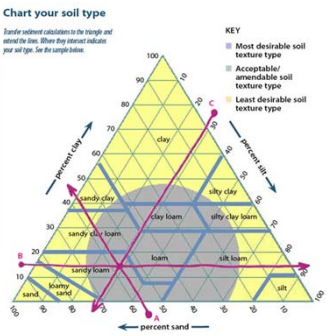
Third,

- Shake until dissolved
- Immediately set down
- Leave undisturbed for 24 hours

Jar Method

Fourth,

- Measure the layers
- Sand will settle out first (bottom)
- Silt will settle next
- Clay will settle last (very light)



To Improve Regular Garden Soil

- Water retention
  - Peat moss, vermiculite, perlite
  - Sawdust or wood shavings (add extra nitrogen)
- Old hay or straw, leaves
  - May contain weed seeds
- Compost
- Organic Matter
- Sand

Soil Preparation

- Measure out your planting area
- Keep a walking area around it
- Remove the top 4 to 6 inches of soil, then loosen another 6 inches
- Work until soil particles are small
- Wet it down

Making Better Soil

It may sound funny, but in Utah, we have to "make" our soil:

- Add to your soil the component it is missing
- Sand
- Clay
- Silt (decomposed organic matter)
  - Most important of all amendments in Utah
- The key: the right soil = awesome results

Working My Soil…

My Soil

Sunlight – Full Sun

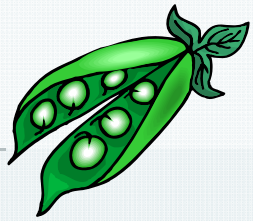
- Full sun = 6-8 hours
- Most vegetables will need at least 8 hours
- Cool weather crops can do with less
- Know your plant needs

Sunlight – Full Sun

- Beans
- Broccoli
- Corn
- Melons
- Eggplant
- Tomatoes
- Cabbage
- Summer Squash

Sunlight – Partial Light

- Partial = 4-6 hours
- Beets
- Carrots
- Peas
- Onions
- Radishes
- Cucumbers
- Winter Squash
- Lettuce



Watering

- When possible, use drip irrigation
- Make a slight depression around each plant
- Water with a dipper from a bucket, or carefully with the hose
- Water twice per week (depends)
- Trench watering

Watering

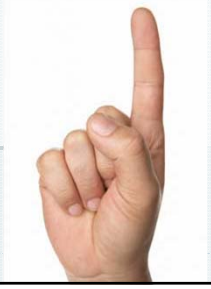
- The key is to keep consistent moisture levels in the soil
- Uneven moisture levels can result in poor production
  - Uneven production, splitting, blossom end rot
- To help maintain moisture, mulch

Watering

Box Garden Soil	Regular Garden Soil
Must water more often	Water less often
Dries out faster	Sand drains faster than clay
Drains faster	Can over water
Nitrogen travels with water	To help maintain moisture, mulch

Watering – Monitoring

Use the "soil moisture monitor"



Moisture Control – Mulch

- Mulching can be done carefully when plants are small
- As plants grow, leaves form a canopy over soil, keeping moisture in
- Mulch can be applied in many different forms
  - Mulch material
  - Grass clippings
  - Plastics or coverings

Moisture Control – Mulch

Moisture Control – Compost

Mulch and Compost – Other Benefits

- Acts as a natural weed barrier
- Add nutrients (macro and micro) into soil
- Encourages deep root growth
- Plants that are mulched are happier, healthier, and have more friends

Fertilizers – General Rules

- Follow the instructions on the package!
- General rule: Broadcast 1 ½ lbs. of a blend of 16-16-8 per 100 sq. ft.

OR

- You can band the fertilizer
  - Make a furrow 3 inches deep about 2" away from the planted seeds
  - Using 1/3 to ½ cup of a garden fertilizer per 10 ft. row

Fertilizer Specifics

- Feed soil-less mixes 3 or 4 times per summer as needed
- Feed garden soil at planting and banding
- Water soluble fertilizers work great when transplanting
- Fertilize with high nitrogen when succession planting
  - Helps break down organic matter
- Heavy fruiting plants may need specific feeding
  - Phosphorus needs are high for melons, garlic, and squash

Small Space Specifics

- Garden layout
- Grow vertical
- What to plant
- Planting methods
  - Interplanting
  - Succession planting

Spacing

Remember:

- Don't think in just rows
- Think in clumps or areas
- Water must be available to every plant
- You have to work it after it is planted, plan accordingly

CAULIFLOWER, Early Snowball -- ***Brassica oleracea (Botrytis)***

When planted in early spring or late summer so that it can mature in cool weather, this popular cauliflower variety rewards you with large heads of snowy white curds. Enjoy this mild-flavored vegetable raw, steamed or pickled.

Planting Depth	Seed Spacing	Days to Sprout	Spacing After Transplanting	Spacing Between Rows	Days until Harvest
1/2"	2 seeds per pot or cell	5-10	18"	24-36"	60*

*From setting out transplants.

PLANTING: For a spring crop, start seeds indoors 4 to 6 weeks before planting outdoors. Harden off seedlings by putting them outside during the day for 1 week before transplanting. Plant after danger of a hard spring frost is past. For a fall crop, transplant seedlings into the garden in mid to late summer. Before transplanting, enrich the soil with compost.

GROWING: To avoid disease problems, don't plant where cauliflower or related plants grew within the last 2 years. Water regularly and fertilize monthly. When the head begins to form, tie the outer leaves up over the top of the head to "blanch" it (make the curds white).

HARVESTING: Cut the stem just below the central head while the flower buds are small and tight.

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Spacing For Plants **Both Directions**

- 2-4 inch spacing for: beets, carrots, bush beans, onion seeds, green onion, parsnips, peas, radishes, spinach, and turnips
- 4-6 inch spacing for: lima beans, pole beans, swiss chard, chives, bulb onions, kohlrabi, leeks, marigolds, and nasturtiums
- 12-18 inch spacing for: broccoli, cabbage, cauliflower, corn and other large plants
- 24-36 inch spacing for: cucumbers, squash, compact melons

Vertical Growing

- Many gardeners forget that your space available is 3 dimensional
- Many vegetables can grow very well vertically
- More intensive plantings can be achieved
- Consider the shade that is created when growing vertically

Vertical Supports

- Provide at least two posts 5 to 6 feet tall
- Horizontal bar across the top
- String twine, netting, or fencing for your vertical plants
- Remember, vegetable are **heavy**…plan for weight

Vertical Crops

- Some crops can be trained to grow vertically
  - Cucumbers
  - Most squashes
  - Beans
  - Peas
  - Tomatoes
  - Melons
  - Oh, and corn ☺

Cucumbers

- Train the central stem up a string
- Pinch back the side branches to 12 to 15 inches long
- Fit available space
- May want to try an "A" frame

Tomatoes

- T – Posts and twine
  - T-post – 2 plants – T-post – 2 plants – T-post
  - Twine on either side of T-post every 6-8 inches
  - Train plants to grow "between" twine
- Twist main stem around a string once/week
- Pinch out the side branches when they're just starting to grow
- "sucker" tomatoes

Space Utilization

Space Utilization

Espalier Trees

Espalier Trees

Espalier Trees

Backyard Orchard Culture (Dave Wilson)

Pole Beans

- Pole beans can be planted in the corn patch as soon as the corn is 12 to 15 inches high
- Anything vertical, they can climb

Interplanting

- Planting smaller faster growing vegetables in the spaces between larger slower growing vegetables
- Faster veggies will be done and gone before larger veggies need the space
- Lettuce, radishes, swiss chard, spinach, can be planted between tomatoes or peppers, etc.

Succession Planting

- When one vegetable is harvested, it can be replaced with something else
- Do not replant the same vegetable in the same place (causes soil depletion and disease build-up)
- Example: When early cabbage is complete, plant sweet corn in its place

Companion Planting

- Beans planted next to corn will help replenish the nitrogen that corn draws out of the soil
- Pole beans and corn work really well together

The Three Sisters

Native Americans grew three vegetables together:

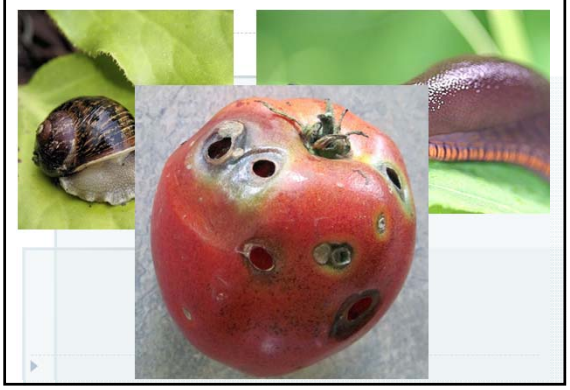
- Corn
  - Use nitrogen from beans and provide height and shade
- Beans
  - Produced nitrogen for corn and used corn for structure
- Winter squash
  - Used corn for shade and provided ground cover for moisture control

Record Keeping

- Record the dates when seeds are planted, when they germinate, and when harvested
- Make note of problems or successes, and suggestions of what you would do the next time

Pests

- Pests are easily spotted in a smaller working area
- Pick off worms, wash off leaves if eggs are present
- Place small wooden planks where snails or slugs might attack and then check under boards periodically
- Vertical gardening keeps soil clear and no moisture havens for insects and pests
- Must consider faster evaporation in some cases



Some Questions To Answer

- Will hoses and taps be available for your planting area?
- What kind of irrigation will work best for your garden?
- Are your garden areas easily accessed from the house?
- What light is available?
- What plants should I plant?

Watering Techniques

Drip Irrigation

Final Points

- USU Extension Office
  - extension.usu.edu
  - (801) 851-8460
- Carrots Love Tomatoes – book
- Let it Rot – book
- Try, learn, try something different
- Record, record, record
- Soil is the key!