ORGANIC GARDENING

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The organic approach

- Mimics nature
- Recycles nutrients and waste
- Minimizes external inputs
- Preserves and enhances soil biological activity
- Conserves soil (texture, crusting, erosion)
- Conserves soil moisture
- Potentially eliminates the need for traditional chemicals
- Generally promotes human and ecological health

Modified Organic Gardening

- Most Homeowners should use a balanced approach
- Be willing to accept some damage.
- Be willing to spend more time conditioning soil and scouting garden for problems.

Necessities

- Healthy Soil
- Healthy Plants
- Provide them what they need and want
- Protect from weeds and other pests/disease
- Remove sick/diseased plants

Soil- Most Important Component

- Soil is the key!
- "Feed the SOIL, not the plant"
- A healthy, organic, well drained soil should produce vigorous plants and nourishes soil microorganisms

Soils – What to do?

- Have your soil tested! (Basic test and Organic matter)
- Optimum OM in the soil is around 5% (around here- 3% is great)
- Raw materials to be incorporated need to be 90-120 days in advance of planting
- To maintain organic levels must add 4 cubic feet of compost per 100 square feet
- Incorporate amendments immediately to prevent leaching and runoff

Be Generous in Organic Amendments

- You can't use too much (within reason)
- Minimum of 4 inches in top 12 inches - Find a reliable source - know the history
- Look at amendments more for their soil building capacity, than fertilizer
- Use raised beds to make sure area has proper drainage and easier to amend
- Make sure the amendments are applied when the plant can use them, not the weed

Tillage

- Improves soil structure
- Mixes topsoil into subsoil
- Speeds process of organic matter breakdown due to introduction of more oxygen into soil
- Can bring more weed seeds to the soil surface but will kill surface weeds (usually)

Encourage Healthy Plants

- Buy healthy plants initially (check for bugs and diseases when purchasing)
- Give optimum conditions
  - Soil
  - Sun
  - Water
  - Mulch

Water

- Utilize efficient methods of irrigation (drip, soaker, etc), more targeted approach
- Wet foliage = disease problems or burns
- Splashing rainwater/irrigation = disease problems
- Test your water if plant problems occ

Mulch

- Newspaper/wheat straw
- Pine straw
- Hardwood mulch
- Chopped leaves
- Plastic
- Cover crops

Mulch

- Retains moisture
- Cools/heats soil (maintains temperatures)
- Prevents some diseases
- May discourage some insects

Key Organic Strategies

- Crop Rotation -- for fertility, weed control, to break pest & disease cycles
- Cover Crops/Green Manures -- for fertility, to prevent erosion
- Diversity -- to encourage ecological interactions, let nature work for you
- Compost -- to recycle organic wastes, provide food for soil organisms
- Observation!!

Crop Rotation: 3 objectives

- Control Insects and Disease
- Manage Weeds
- Manage Nutrients and Build Soil

Crop Rotation to Manage Nutrients

Rotate Crops w/ Crops

Heavy Feeders:	Light Feeders:
Corn	Peas
Spinach	Peppers
Squash	Radish
Tomatoes	Beans

Crop Rotation

Don't plant anything from the same group (family) in the same location or soil two (three) years in a row.

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Lima Beans	Potatoes	Brussels sprouts	Cantaloupe	Sweet Corn	Beets
Pole Beans	Eggplants	Cauliflower	Cucumber		Carrots
Field Peas	Tomatoes	Collards	Honeydew melons		Garlic
Peas	Peppers	Lettuce	Pumpkins		Onions
		Radishes	Squash		Shallots
		Rutabaga	Watermelons		
		Spinach			
		Turnips			

Crop Rotation for Insect and Disease Control

- Rotating crop families breaks up pest and disease cycles by removing host plant from the system depends upon:
  - Dispersal Ability of Pest or Disease (can it fly?)
  - Host Specificity (can it survive on another plant family?)
  - Ability of Pest to Persist w/o Host (does it have a dormancy period?)
  - 3 years off

Cover Crops and Green Manures

Rotate Crops w/ Cover Crops to:

- Replenish/Add Organic Matter
- "Mop up" Soluble Nutrients in fall
- Tap Leached Nutrients w/ Deep Roots
- Scavenge nutrients
- Fix nitrogen with leguminous green manures
- Control weeds

Weed Control

- Mulch, Mulch, Mulch
- Cultivation
- Good, strong plants crowd out weeds

Weed Control

- Flame
- Corn Gluten as a pre-emergent
- Vinegar
- Soil sterilization

Dealing with Insects & Diseases

- Rotation
- Sanitation (remove and compost debris where pests could overwinter)
- Physical Barriers (floating row covers, kaolin clay, collars for cutworms)
- Predators and parasites (biological control)

Parasitic wasp eggs on Tomato hornworm

Floating row cover

Dealing with Insects & Diseases

- Trap crops (blue hubbard squash for cuke beetles)
- Refugia for beneficials (flowering plants)

- Companion planting

Pest Control Materials

- Insecticidal Soaps ("Safer")
- Microbial insecticides (Bt for Colorado Potato Beetle)
- Botanical insecticides (rotenone, pyrethrum, neem, nicotine, garlic, hot pepper spray)
- Copper and sulfur sprays as fungicides (potentially toxic - *use only as last resort)*

Keep Things Clean!

- Remove old crops after they are finished
- Pick off damaged or diseased leaves or fruit
- Remove plants with viruses immediately
- Do not smoke or use tobacco near garden
- Turn garden soil frequently
- Use only fresh certified seed or transplants