Organic Gardening I

Master Gardeners
El Dorado County
UCCE Cooperative Extension
Introduction

- What is “Organic Gardening”? 
- Why did so many inorganic procedures come into use? 
- How to resolve Gardening Contradictions
Start with the Soil

- What is soil
  - Origins
  - Good, Bad, ugly…

- Retains and supplies water
- Allows air to be available
Soil Characteristics

Composition

- Minerals are about 45-50%, derived from weathered, eroded rock, new minerals formed in soil
- Water is about 25%
- Air is about 25%
- Organic material is about 5%, derived from decayed plant and animal matter
Soil Characteristics

- Texture = size of particles
  - Sand: largest particle, good pore space, poor nutrient holding
  - Silt: mid size particle
  - Clay: smallest particles, good nutrient holding, water retention, hardest to work
  - DON’T add sand: Clay + Sand = Concrete
  - Good Soil Tilth = Good Soil Health!
SOIL TEXTURES

Soil is important for life. Without it, many plants that we depend on for our oxygen and food could not grow.

There’s more to soil than it just being a lump of dirt. Here are some different soil types:

- Loamy soil
- Silty soil
- Clay soil
- Peaty soil
- Chalky soil
- Sandy soil

Use the menu button to find out more.
Soil Characteristics

- Soil pH
  - What is it
  - Why is it important
  - How can you correct it
The pH Scale for Soils

- **Acidic**: Battery Acid, Lemon Juice, Cola, Orange Juice, Coffee, Corn, Distilled Water
- **Optimal Range for Most Terrestrial Soils**: Sea Water
- **Basic**: Antacid, Ammonia, Bleach, Lye

**The pH Tolerance Levels for Plants**
- **Acidic**: Bunchberry, Crowberry, Rosy Twistedstalk, Twinflower
- **Neutral**: Tea, Aster, Birch, Bleeding Hearth, Blueberry, Brockenfern, Chinquapin, Fir, Hemlock, Indian Pipe, Oregon Iris, Pearly Everlasting, Pine, Rattlesnake, Plantain, Rhododendron, Scotch Broom, Spreading Phlox, Spruce, Wild Ginger
- **Basic**: Arnica, Blackberry
- **Neutral**: Alder, Apple Tree, Chicory, Larch, Timothy Grass
- **Basic**: Yew, Beech, Hazelnut. Black Oak, Clover, Colorado Spruce, Douglas Fir, Red Cedar, Spreading Dogbane, Vetch
- **Basic**: Ash, Baneberry, Black Hawthorne, Buckthorn, Buttercup, Camas, Catalpa, Chokecherry, Cinquefoil, Columbine, Currant, Dandelion, English Ivy, Foxglove, Honeysuckle, Larkspur, Loosestrife, Maidenhair Fern, Maple, Ninebark, Orchard Grass, Oregon Grape, Oxalis, Penstemon, Rose, St. John's Wort, Saffrage, Shooting Star, Snowberry,
Soil Structure

- How particles are arranged
  - Avoid Compaction – need pore space
  - Don’t Cultivate when wet, esp. clay
  - Don’t Over-cultivate, walk on fresh beds or overuse heavy equipment.
  - Good Soil Tilth: Nutrient, water and air holding ability and workability is achieved by incorporating organic matter yearly.
Soil Structure

Granular

Blocky

Platy

Massive

Single grain

1 inch
Tillage

- How easy soil is to work – why?
Tillage

- Make seedbed, provide good soil contact with seed
- Mix in soil amendments
- Bury residues that carry plant disease organisms
- Control weeds
- Discourage vertebrate pests
Tillage

Why…
- Deep to break compacted layer, encourage deeper rootining
- Level soil for furrow/basin irrigation
- Release nutrients from organic matter
- Improve water infiltration
What is tillage?

Mechanical modification of soil structure
Tillage

- What’s bad about it?
Tillage

- Oxygenates soil (burn up organic matter)
- Destabilize aggregates, reduces organic matter
- Reduces earthworms
- Can create compaction
- A lot of work!! (and/or use of fuels)
Soil texture tests

- Field test – use your hand

- Jar test – soil, water, detergent in jar
Soil texture tests

- Drainage – puddling
- Soil color
  - Black/dk brown – organic matter
  - Brown/red/orange – well drained
  - Blue gray/olive green – poor drainage
  - White/gray/variegated – poor drainage, leached salts, volcanic ash
Fertilizer

- Basic plant needs
  - Sunlight
  - Air
  - Water
  - 17 essential nutrients
Nutrients

- Major nutrients – N-P-K
  - Nitrogen – growth, esp. food crops
Nutrients

- Phosphorus – photosynthesis, seed set, root growth
Nutrients

- Potassium (Kalium) – for starch and protein synthesis, size and quality of fruit, disease resistance
Nutrients

What do the numbers on the bag mean?
- N – given as a weight, % of pure element
- P - % weight of phosphate (P2O5)
- K - % weight of potash (K2O)
Nutrients

- Plants absorb ammonium form of N, or nitrate form
- Phosphorus absorbed as phosphate – not water soluble
- Potassium absorbed as potash
Secondary Nutrients

- Calcium (Ca) – component of cell wall and membranes, regulates soil acidity
- Magnesium (Mg) – chlorophyll, enzymes
- Sulfur (S) – used to lower soil pH, but can be toxic in large quantity
- Trace elements – needed in very small amounts, in organic matter
Soil Fertility

Additional practices to improve soil fertility

- Foliar feeding
- Cover Crop Planting
  - Cool weather
  - Summer crops
- Mulching
- Correcting soil pH
Compost

How do we start?

What goes in

- Green
- Brown
- Other
Compost

- Methodology
  - Size
  - Layering
  - Covering
  - Moisture
Compost

- Process
  - Temperature
  - Moisture
  - Appearance
Compost

Problem solving
- Odor
- Driness
- No progress
Compost

- How to use
  - Crops
  - New beds
  - Lawns
  - Containers
  - Mulch
Compost tea

What is compost tea?
- Made by aerating compost in water
- Microbial food source
- Aerobic process
Compost tea

- How do we use it
  - Foliar
  - Soil Drench
Questions