

SOIL BASICS

What is soil?

- Soil is a thin, fragile, life-supporting earth layer
- It forms an interface between the atmosphere and crust
- It is made of broken down rocks (minerals), organic matter and microscopic organisms
- It is a non-renewable resource
 - Rare and made slowly – Protect it!
 - Less than 10% of the earth's surface is arable soil
 - It takes 500 years to make 1 inch of soil
- Soil is dynamic
- Soil is a medium for plant growth

Soil is composed of:

- Mineral Particles – 45%
- Air – 25%
- Water – 25%
- Organic Matter – 5%
 - Humus – 80%
 - Roots – 10%
 - Organisms – 10%

Soil provides plants with S.W.A.N.

- Support: Supports roots to provide plant stability
- Water: Soil supplies nearly all the water a plant uses
- Air: Plants breathe through roots and leaves; too much water in the soil means no room for air
- Nutrients: Enter the plant through roots

Macronutrients and Micronutrients

- Macronutrients
 - Nitrogen (N) - Phosphorous (P) - Potassium (K)
 - Often low in our So California soils
 - Most common deficiency is Nitrogen
 - Calcium (Ca) – Magnesium (Mg) – Sulfur (S)
 - Often present in our soils
- Micronutrients
 - Boron, Copper, Chlorine, Iron, Manganese, Molybdenum, Zinc

Soil Particle Size

- Largest to smallest: Gravel > Sand > Silt > Clay
- The smaller the particle size, the stickier the soil is chemically
- Clay holds water and nutrients very well, but is hard for plant roots to penetrate

Soil Type and Texture

- Loamy sand – coarse, forms no ribbon
- Loam – medium texture, forms ½” ribbon
- Clay Loam – medium texture, forms ¾” ribbon
- Clay – fine texture, forms +1” ribbon

Improving your soil – Fertilizers and Amendments

- Fertilizers add nutrients that plants need to grow
 - Macronutrients and sometimes micronutrients – information on product labels
- Amendments improve the structure of the soil
 - Chemical balance
 - gypsum to break up clay
 - sulfur to decrease pH
 - penetrants to reduce water tension
 - Physical qualities – improve
 - tith – structure, physical condition
 - aeration and drainage
 - water movement through
 - nutrient retention

Organic Matter

- Productive soil contains water and air (50%), minerals (45%) and organic matter (5%)
- Organic matter is composed of microorganisms (10%), plant roots (10%) humus (80%)
- Humus is decomposed plant matter; well-rotted compost
- Green manure – cover crops such as fava beans or bell beans
 - Grow as fertilizer and then dig it in as an organic amendment
 - Don't forget to mulch, mulch, mulch

Good soil has:

- Adequate minerals, nutrients and organic matter
- Active biological life
 - earthworms, beneficial insects
 - microorganisms and beneficial fungi
 - healthy plant roots (dispose of diseased plants, roots and all)

Resources

Know your Soil <http://ucanr.edu/sites/sacmg/files/163131.pdf>

Managing Clay Soil <http://ucanr.edu/sites/sacmg/files/117122.pdf>

What's In That Bag? – Soil Amendments http://ucanr.edu/sites/sacmg/Soil_Amendments/

uccemg.com hotline@uccemg.com

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