Down and Dirty With your soil

What I'll cover tonight



- Soil Texture
- ™ How to test it and what the results mean
- Water and how it moves
- № Hard to manage soils: High Salts, High pH, Heavy Clay

- Any other issues you might have.

Soil Basics



- **Texture**: This refers to the size of the particles that make up your soil
- Sand- Gritty and large
- **Silt-** Smooth and medium

Other Basics



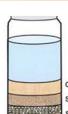
- Mulch=Bark: made from various tree materials. Left on top to retain moisture and reduce evaporation and inhibit weed growth
- Compost: Decomposed organic material: great conditioner. How do you know when it's ready?
- **™ Manure**: Best if composted, Great conditioner
- **⇔** Soil Conditioner: Pre-Made products to improve soil structure.

Soil Test



- ™ Texture by measurement
 See Handout
- ™ Texture by feel
 See Handout
- Prainage Test
- Color Test
- © UC Davis Analytical Lab Davis, California 95616-5270 Phone: (530) 752-0147 Email: anlab@ucdavis.edu

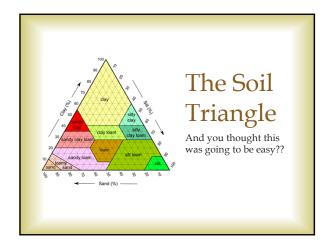
Soil Texture by measurement



Clay layer – water clears

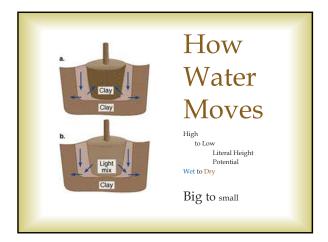
Silt layer - 2 hours

Sand layers - 1 minute





Color Test C3 C4 Dark Soil: In general, the darker the soil the more organic material it has C4 Brown-red: This is usually a sign that the soil drains well and breathes well C4 Blue-Green or Gray: Continuously wet, not good C4 Yellow: A sign that the soil is imperfectly drained C5 Mottling or Streaking: seasonal or periodic drainage problems



Salty/Alkaline Soils

- Coal Lots of Salty Cations: Potassium-K, Soduim-Na, Magnesium-Mg, Calcium-Ca
 Coal Test multiple areas of your yard to get a better idea of what the pH of your soil actually is
- ∞ pH > 8.5
- № Poor Structure
- Communication
 Com
- On Dominant presence of Sodium carbonate, They cause the soil to swell and make it difficult to settle

Why does the pH of my soil really matter? 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 Phosphorus Potassium Sulfur

Magnesium Iron Manganese Copper and Zinc Molybdenum

Methods	of 1	lowering	nΗ
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- ${}^{\mbox{\tiny \mbox{CM}}}$ Iron Sulfate- To lower: from Ph8 to Ph 6.5, about 30 lbs per $100\mbox{ sq}$ feet $*1$
- ∝ Soil Sulfur- To lower: from Ph8 to Ph 6.5, about 3.5 lbs per 100 sq feet *1
- Gypsum & Aluminum Sulfate-wouldn't use
- № Leach the salts from your soil
- ™ Compost, Compost
- Call Leaching: Salts rise to the top over time, Water deeply
- Plant Salt sequestering material, Halophytes:
 Pickle weed, Abronia, Atriplex, Distichlis, etc

Gypsum



- Both Sodium and Calcium are salts
- Gypsum can help to loosen clay soil

Leaching Salts



- Only Practical way of removing excess salts
- The amount of salts removed depends on quantity and quality of water during one irrigation period
- ™ Must not run off surface, Needs to drain down
- Apply slowly

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Soil Amendments



- Soil amendments: Any material added to soil to improve its physical properties
 - ✓ Manure
 - ✓ Fertilizers
 - Compost, Compost, Compost

Amendment- General Rules



- ™ Mix thoroughly
- № Plant based amendments are low in salts.
- - Improve aggregation, porosity, permeability, aeration, drainage, and rooting depth
- ⋈ Hummus-Dip for Pita Chips

Manure

Benefits

- ™ Usually free, except for transportation
- ☼ Organic matter addition to the soil
 ☒ Increase H2O holding capacity of the soil
- Reduce erosion.
- Contains both slow-release and quick-release/available nutrients

Disadvantages

- № You don't know what is
- № Potential E.coli
- soil, the nutrients can be volatilized into the air
- № Presence of weedy seeds
- Horse manure: Many weed seeds, High in salts

Fertilizers



- ∝ Known amounts of: N, P, K
- ™ Buy specifically for particular crops
- ≪ Known properties of the materials used: bone meal, feather meal, kelp etc

- ${\color{red} ext{ \font }}$ Organics come with Dormant beneficials:
 - 😘 Archea, Mycorrhizae, Bacteria,

Compost



Benefits

- Concentrated nutrients
- № Beneficial microbes
- Slow release nutrients
- Few viable weed seeds.
- Drier than manures and easier to work with.
- ∞ Do it

Disadvantages

- ∾Not free;
- ™Takes time to produce
- **™**Compost tea
- ™Needs to be managed:
 - ∞ Air
 - ₩ Water

Soil Preparation



- ∝Plan ahead
- ™Dig or Roto-till the planting area
- Rewards soil amendment into the top 6-12" of soil
- - 😘 Easier to irrigate
 - ☑ Easier to calculate

Cubic Yard formula



- ™ You want 4" of bark and 3" of compost?
- You know how big your planting area is.
- Coa Length(65') x Width (40') x Depth (#of inches)/324
- 65 x 40 x 4" = 10,400/324=32 Cubic Yards of Bark
- 65 x 40 x 3" = 7800/324 = 24 Cubic Yards of Compost
- ™ There are calculators online if math scares you.

Amending Clay Soils



- Clay is NOT A BAD THING
- Remember how small clay is? The total surface area of a high clay substrate is HUGE. This is good
 - ${\color{red} \textbf{GS}} \ High \ water \ holding \ capacity$
 - Rut you need to manage it correctly
 - ☑ Excellent nutrient holding capacity
- № The Bad part is the Hard Pan
- ™ You want to add Sand?? Let's look again
- COMPOST, COMPOST, COMPOST

Clay Breakdown



- ™ Heavy Clay Soils need Organic Matter additions
- ™ The top 8-10" of soil is where plants need to breathe
- ™ Don't try and work it when it's wet
- ☼ This is not a one time venture, Yearly additions to improve the clay.
- № Between 25%-50% Amendment
- № Don't use Peat Moss, Sand or gravel

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- Atriplex spp
- ™ Baccharis
- ∝ Bouteloua
- Chrysothamnus
- Distichlis
- ∝ Grendilia
- Casthenia
- Renstemon (some) c,p
- Salicornia
- Sporobolus

Common Problems



- ∝ Right Plant: Right Place
- Check your Irrigation
- ™ Mulch bare spots, but leave some open for native pollinators
- ™ Fertilize occasionally, new plants not established

QUESTIONS??



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PLANT SALES
APRIL 5th
APRIL 26th
MAY 17th

♥YOU MADE IT!!! THANK YOU FOR **COMING**