Irrigation #1

Water, Plant, & Soil Interactions
Water Plant, and Soil Interactions

THREE MAIN POINTS:
1. Soil type affects irrigation
2. Know these terms:
   - Field Capacity
   - Permanent Wilting Point
   - Available Water
   - Moisture Available Depletion
3. Use a soil probe
Water, Plant, & Soil Interactions

What’s Inside Your Binder?

- Course Slides
- Self Assessment

See the Addendum for:

- Soil Triangle (Addendum page 1)
- Soil Texture (Addendum page 2)
- Soil Probe Brochure (Addendum pages 3-4)
What is Soil Made of?

- Minerals: 45%
- Water: 25%
- Air: 25%
- Organic Matter: 5%
Physical Properties of Soil: TEXTURE

• Soil Texture
  - How it feels

• Sand / Silt / Clay
  - Describes size of mineral particle

• Loam
  - 40% sand
  - 40% silt
  - 20% clay
Soil Particle Size

**Barrel**

**Sand**
*feels gritty*
2.00 - 0.05 mm

**Plate**

**Silt**
*feels floury*
0.05 – 0.002 mm

**Coin**

**Clay**
*feels sticky*
< 0.002 mm
Soil Particle Size

- Sand: Basketballs
- Silt: Softballs
- Clay: Golf balls

• Which one holds more water?
• Which one has more air space?
How Water Travels in Soil Types

Appearance of water on soil surface

- Sandy
- Loam
- Clay

Cross section of water movement through soil

- Sandy: 2' to 3'
- Loam: 3' to 5'
- Clay: 5' to 7'
Irrigation Terms

- Field Capacity
- Permanent Wilting Point
- Available Water
- Infiltration Rate
- Moisture Available Depletion
Sponge Test

• Sponge test demo to illustrate water holding capacity.

• Dense sponge vs. airy sponge
Soil Horizons

- **Organic matter**
- **A Horizon**: topsoil, root activity
- **B Horizon**: subsoil transition zone
- **C Horizon**: rock & fragments
Field Work

• Soil probes
• Site assessment
• Soil ribboning
Soil Probes

Different soils in the same bed (*landscape island*)

Soil break in turf
Soil Ribboning

3”+ ribbon, dark, sticky = CLAY

Cannot form ribbon = SAND
Review and Questions

• 3 Main Points:
  1. Know your soil type
  2. Use a soil probe to assist in determining irrigation schedule
  3. Know these terms: Field Capacity, Permanent Wilting Point, Available Water, Moisture Available Depletion

• Name benefits of proper irrigation:
  - To Gardener
  - To Client
  - To Environment

• How does soil type affect irrigation?
• How can a soil probe be useful to you?