Basic Definitions
Soil Components

- Voids
- Solids
Soil Components

• Voids
• Solids
Soil Components

• Voids
  – Air
  – Water
• Solids
Soil Components

- Voids
  - Water
- Solids
Soil Components

• Voids
  – Air
  – Water

• Solids
  – Particle Size
  – Gravel, Sand, Silt, Clay
  – Loam
  – Organics
Dry or wet sand?

http://flickr.com/photo/56844661@N00/4846203074
Compaction
Photos courtesy of Ecosoil GmbH
Moisture Density Relationship

- **Moisture Content**
- **Soil Density** (mass/volume)

- **Maximum Density**
- **Optimum Moisture**
Moisture Density Relationship

Moisture Content

Soil Density

mass/volume

Moisture Content
Figures 6 and 7. Depth of compaction as (6) axle load and (7) soil moisture increases
(Adapted from Soehne, 1958).

From: www.extension.umn.edu/distribution/crop systems/dc3115.html
Soil clods
Figure 5. Reduced root growth due to compaction from raindrop impact, tillage, and wheel tracks.

Source: Compaction-Soil Management Series 2. University of Minnesota Extension Service, BU-7400
Figure 4. Effects of weather on crop yield response to compaction level (adapted from Soane et al., 1994).
Cone Index of Construction Site Soils

- Rooting Limited at 2000 to 2500 kPa
- Silty Loam 5000 kPa
- Sandy Loam at surface 2000 kPa
- Sandy Loam at 12 inches 3000 kPa
Thank You