

## Describing and Interpreting Soil Profiles

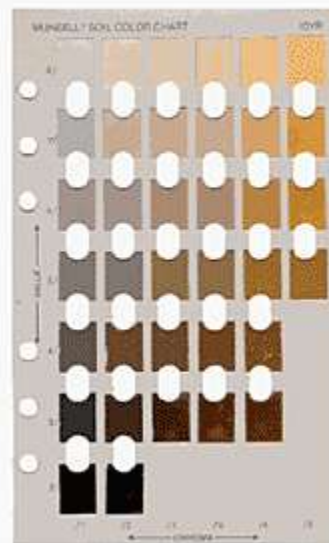
### Coloring Agents in Soil

- **Organic Matter (carbon):** Very strong coloring agent. Makes soil dark or black colored such as in an A horizon or topsoil.
- **Compounds and elements:** Such as iron, sulfur, manganese, etc. Iron is a dominant element in soils, when well aerated iron-oxides (rust) coat particles giving the soil a yellowish-brown to reddish color. Manganese oxides are purplish-black color

Gray colors will exist in soils that are not well drained. These gray colors are developed by the reduction and movement of iron in wet areas of the soil. As iron moves, the reddish or brownish color disappears, leaving behind gray colors. In general, these spots of gray color are called mottles.

### Soil Color

- The munsell color book is used to document color in a standard notation.
- **Hue:** Dominant spectral color.
- **Value:** The degree of light/dark of a color in relation to a neutral gray scale.
- **Chroma:** Strength of hue.



The hue is determined by the numbers and letters in the upper right-hand corner of the page. The

page given above represents hue 10YR. The value is represented by the numbers given on the left side of the page, and they are read vertically. Chroma is given across the bottom of the page and is read horizontally. So, an example of a proper Munsell designation is 10YR 5/6. Students should refer to the Soil Survey of Lewis County to determine how these colors are used in profile descriptions.

## Reading Soil Colors

- Optimum conditions
  - Natural light
  - Clear, sunny day
  - Midday
  - Light at right angles
  - Soil moist
  - NO sunglasses!



Soil texture is defined as the relative proportion of sand, silt, and clay. Particle sizes for each fraction are as follows:

1. 1. Rock Fragments  $>2$  mm
2. Sand 2 - 0.05 mm
3. Silt 0.05 - 0.002 mm
4. Clay  $< 0.002$  mm

Soil texture is important because it affects:

1. Water-holding capacity
2. Ability to store nutrients
3. Movement of water into and through the soil (pollutant leaching potential)
4. Erodibility
5. Shrink-swell potential

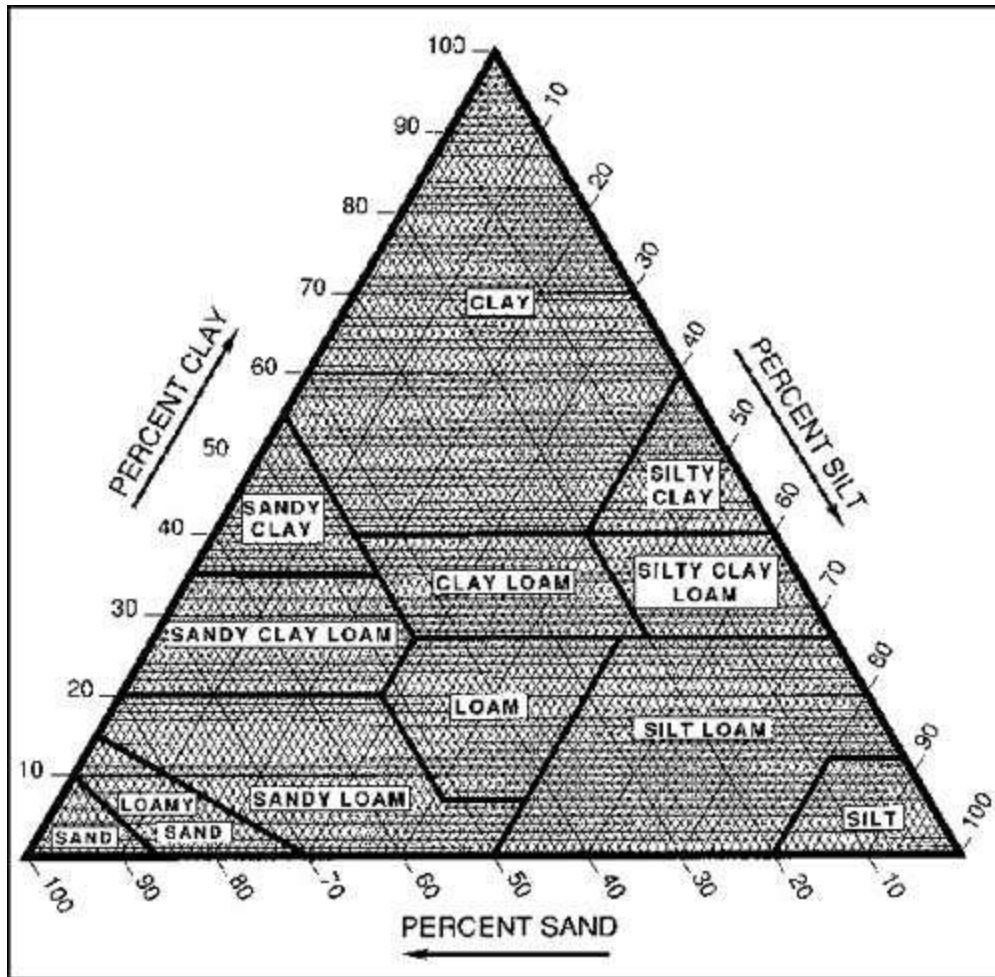
Texture classes in the United States are represented by the texture triangle presented below.

Flowcharts to assist in determining texture can be found at:

<http://soils.usda.gov/sqi/files/KitGuideComplete.pdf> and  
<http://ltpwww.gsfc.nasa.gov/globe/tbf/texttris.htm>.

An interactive texture triangle may be found at:

[http://www.pedosphere.com/resources/bulkdensity/triangle\\_us.cfm](http://www.pedosphere.com/resources/bulkdensity/triangle_us.cfm).



Soil structure is defined as the combination or arrangement of primary particles into secondary units called peds. Soil structure is important because it affects water infiltration and movement through the soil, heat transfer, and aeration. Additions of organic matter will improve soil structure.

Types of structure in soils include granular, blocky, prismatic, columnar, and platy. Soils without a specific type of structure are called structureless and may be single grain or massive. More information on soil structure may be found at: <http://tpwww.gsfc.nasa.gov/globe/pvg/prop1.htm>.