

Soil – Field Learning Objectives

New Hampshire Envirothon

What is soil? Soils are composed of Sand, Silt, and Clay. The percentages of each will determine the texture of a soil (Figure 1). These components make up the texture, but it is also important to remember that soil is alive - there are more microorganisms in one teaspoon of soil than people on planet earth.

Our soil resources are important to everyone. They play a critical role in our environment and wise land use. It is important for society to properly protect this vital resource and to understand the functions of the soil and their value in influencing our quality of life.

In terms of soil quality, our soil resources serve three primary roles within our environment. 1) They serve as a medium for plant growth and to regulate the movement and uptake of nutrients. 2) They serve as an environmental buffer to pollutants and 3) they serve to regulate the flow of precipitation within a watershed, whether it percolates into the soil, becomes overland flow into lakes and streams, is taken up by plants, or evaporates back into the atmosphere.

Understanding the soil component is a very important aspect in any natural resource assessment. Soil interpretations are based on the various soil properties found at a site. Each soil will have its own unique set of properties and each horizon (layer) in the soil may have a unique set of properties, as well. There may be only one or two layers in some soils or there may be many layers, with many differences. The ability to read and evaluate a soils map is a valuable tool in site assessment.

Important soil properties are: Depth, Texture, Structure, Consistency, pH, Bulk density, Available water holding capacity, Flooding frequency, Color, and Slope.

There are over three hundred different soils identified in New Hampshire and well over 18,000 soils in the United States. The development of each soil's unique set of properties is influenced by five soil forming factors that contribute to make one soil different from another:

- Time – how long the soil has been developing
- Parent Material – where the soil material came from
- Biotics – organic material and microbial influence
- Topography – slope and aspect
- Climate – temperature and rainfall

Learning Objectives (field):

1. Identify characteristics of a soil pit or soil sample, including horizons, color, structure, texture, and special features.
2. Use a soil triangle to evaluate the texture of a soil.
3. Use a soil survey (online and paper copy) to assess soil properties and conditions, such as drainage class and limitations on selected uses.
4. Determine the drainage class for a particular soil
5. Evaluate a soil profile for soil properties and characteristics, land use history, water table level, and management recommendations.

More soils information can be found at

https://www.nhenvirothon.org/files/ugd/2c48e6_2b600441bf68487c983dc20c5b8b90eb.pdf

For online soil maps can be found at

https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm?TARGET_APP=Web_Soil_Survey_application_2nb2uq1ozkolfzevkzjbs11

Soil Textural Triangle

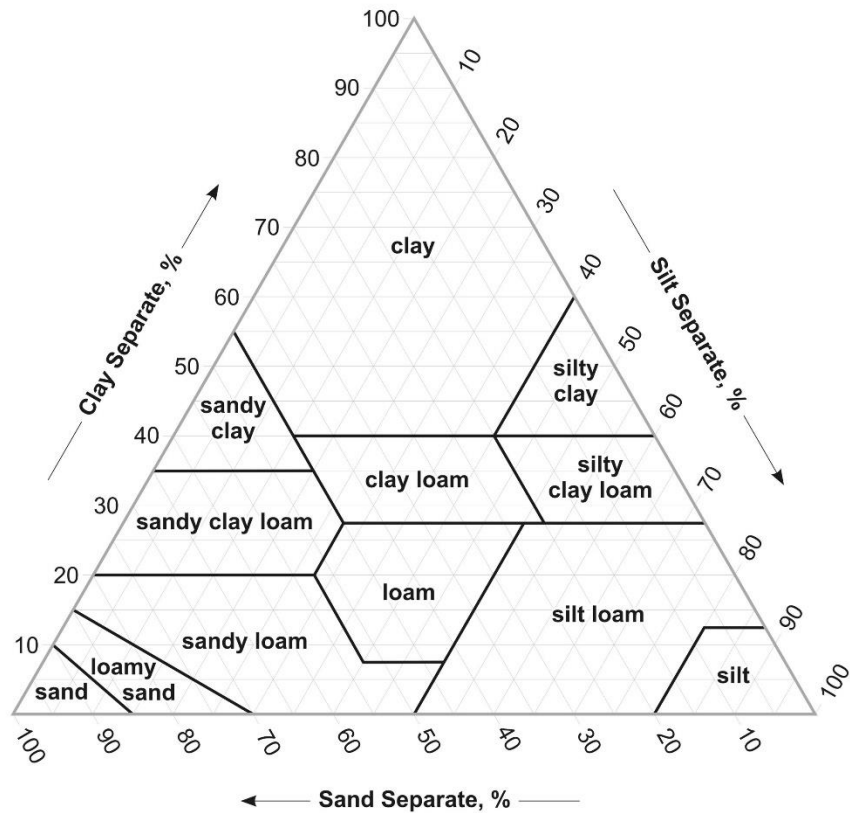


Figure 1. Soil Textural Triangle.

How can we determine texture in the field?

Soil scientists use the texture by feel method to texture soils in the field. There are also laboratory methods to determine soil texture, but these can be cost prohibitive and time consuming. A great method to determine soil texture can be found below.

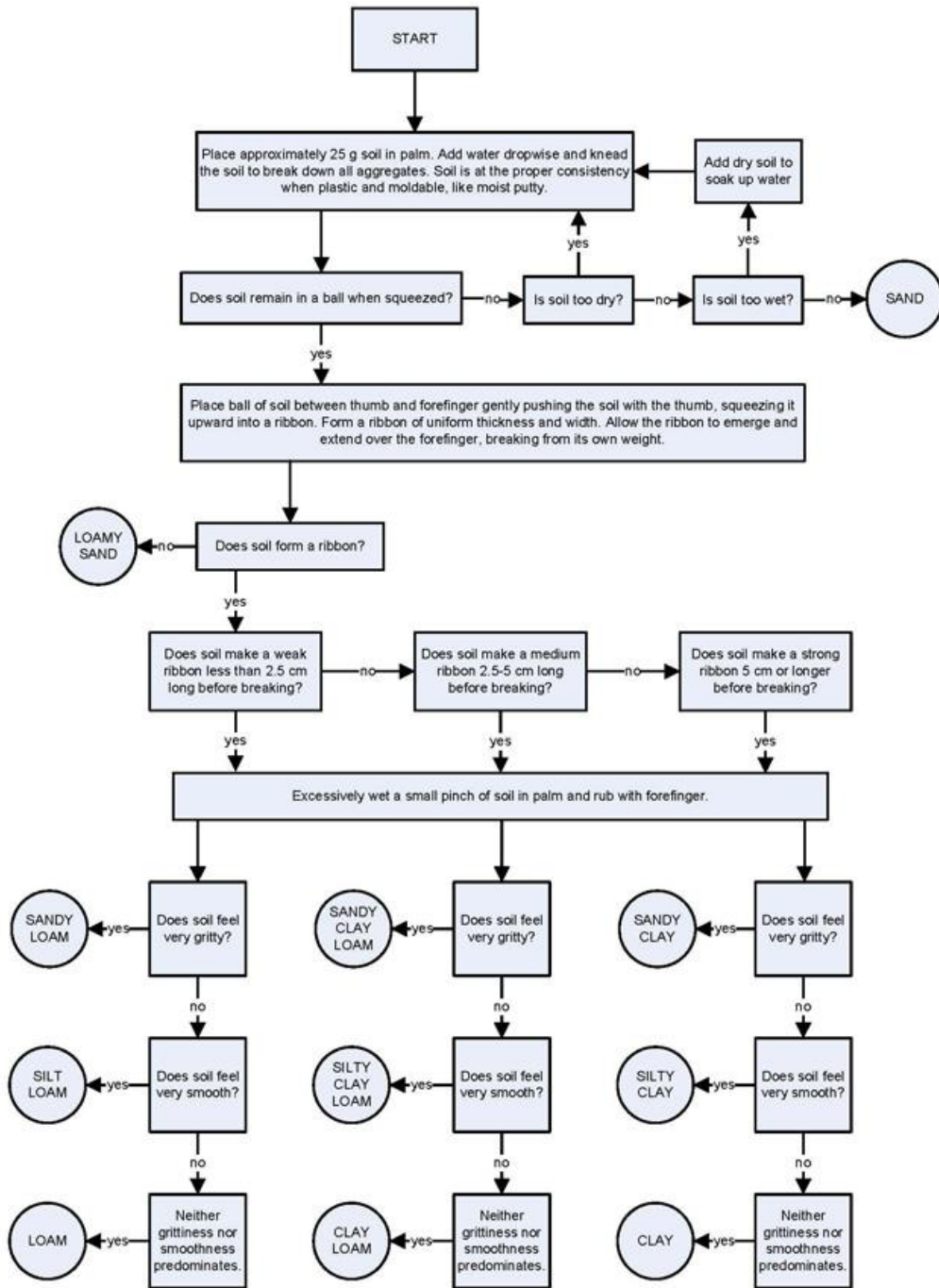


Figure 2. Texture by feel method.

