



Soil Analysis | Estimating Soil Texture (Ribbon and Feel Test)



Physical properties of soil can only be determined accurately by using elaborate laboratory techniques. However, certain information is best obtained in the field, such as the identification of soil texture by feel. By definition, soil texture is the composition of the soil particles expressed as the percentage of particles in the gravel, sand, silt, and clay size after subtracting other components, like organic matter.

gravel	> 2mm
sand	> 0.063mm
silt	> 0.002mm
clay	< 0.002mm

(Note that other countries have their own particle size classification, using different diameter limits)

Objective

Since soil is mostly apprehended as an undefined mixture of different components, this teaching unit aims to conduct an investigation into the texture of a soil sample using both the ribbon and the feel test. Students are expected to distinguish and identify soil particles with the help of this simple field method, spotting the most prominent grain fractions.

Didactic-methodological legitimation

This method can be relatively straightforwardly conducted outside the classroom, such as on the school yard, or on excursions. It may additionally serve as a starting point for further extensive soil analysis (for more advanced studies cf. <http://flux.aos.wisc.edu/~adesai/documents/cmn/2011/activities/Soiltexture.pdf>). With this in mind, the tests described on the method sheet can be applied to varied age groups and tailored to different learning performances. Other strengths of the method are its requirement of only a few materials, and its ability to actively engage potentially all students at any one time.





Soil texture controls many important soil processes, such as its total capacity to hold water, soil aeration, or the cation exchange capacity. For example, clay soils have a greater water holding capacity than sandy soils. In addition, well-drained soils typically have good soil aeration which is conducive to root growth and, for this reason, healthy crop. On the other hand, finely-textured soils are prone to intense leaching in moist environments. This being the case, the physical character of soil fertility is determined by the balance of clay, silt and sand particles.

Advice on location

In planning or arranging the sampling, a place readily accessible and relatively uncovered should be selected. By collecting soil samples from different locations, it is possible to compare different soil textures, potentially indicating appropriate human land uses.

Literature (German):

Geographie Heute – Themen, Modelle, Materialien für die Unterrichtspraxis aller Schulstufen, Juli 2005 Heft 231/232, S. 37

Schroeder, D: Bodenkunde in Stichworten. 5.Auflage, Hirt Berlin 1992.

Literature (English):

Department of Primary Industries: Soil texture tests. URL: http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/127275/Soil-texture-tests.pdf, 08/06/15.

Colorado State University: Estimating Soil Texture. Sand, Silt or Clayey? URL: <http://www.ext.colostate.edu/mg/gardennotes/214.html#feel>, 08/06/15.

