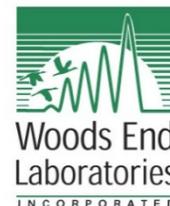


SOIL TEXTURE TEST (SAND SILT CLAY)

SIEVE + BOUYOUCOS HYDROMETER METHOD



WOODS END SOIL TEXTURE METHOD

Soil texture is a dynamic feature of all soils and varies widely across soil series, soil orders and landscape. The actual size of particles extends hugely over 4-orders of magnitude and significantly influences water holding capacity, plasticity, nutrient storage and microbial colonization. Indirectly, texture affects virtually all choices for soil management and cropping with clay content ranking as the most dynamic influencer.

Woods End Soil Lab offers an analysis to reveal the relative portions of sand, silt and clay. The method is to first sieve to obtain two major sand fractions, then employ the Bouyoucos Soil Hydrometer^{1 2} to obtain clay (sand settles too quickly to be found by hydrometer). The hydrometer can reveal a linear settling scale as shown on log-paper (Fig 1) with agreed boundaries used to determine the texture class either by USDA or the international guide, which differ slightly on definition of sand and silt borders (see Table 1).

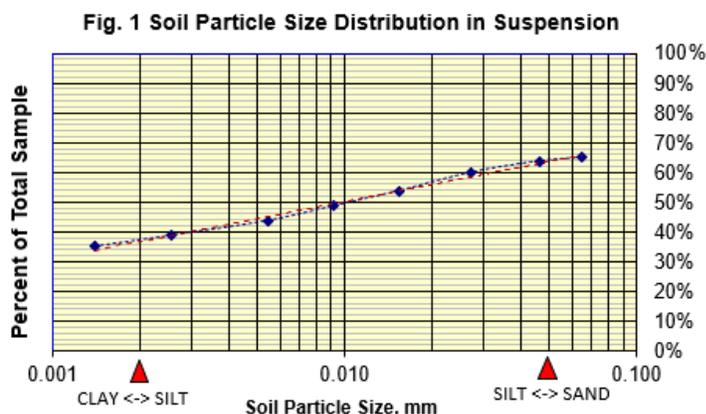


Table 1.

Particle Class	USDA	FAO*
	Size, range, mm	
Very Coarse Sand	2 - 1.0	2 - 1.25
Coarse Sand	1.0 - 0.50	1.25 - 0.63
Medium sand	0.50 - 0.25	0.63 - 0.20
Fine Sand	0.25 - 0.1	0.2 - 0.125
Very Fine Sand	0.1 - 0.05	0.125 - 0.063
Course Silt	0.05 - 0.002	.063 - .020
Fine Silt	0.05 - 0.002	.020 - .002
Clay	< 0.002	< .002

* International Soil Designation

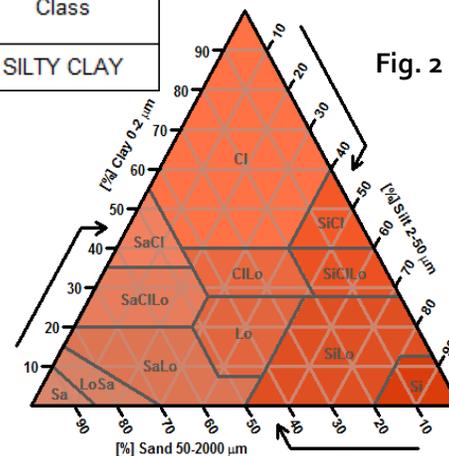
The basis for determination of texture by hydrometer is based on the early 1851 Stoke's Law defining the effect of radius of a particle and its rate of fall in water. Woods End has simplified the test to obtain fine sand and other sand by physical sieve-size, then clay by hydrometer, which remains in suspension at 6.5 hrs (Table 2), the difference being silt. The texture class (USDA) is found from Fig 2. ³

Control Hydrometer in Dispersant: 4.0

Table 2.
Your Report

1	11329.8	Hydrom/ Sieve	Sieve: 106 Mesh	Sieve: 270 Mesh	Time (Clay) 6.5 hr	USDA Texture Class
		40	Medium Sand Group	Fine Sand Group	Hydrometer: 23	
		10	0.0900 0.0090	0.1000 0.0100		
	RESULT	SAND = 2%	SILT = 51%	CLAY = 47.5%	SILTY CLAY	

Soil texture is not necessarily constant in soil but may change over time. It also varies sharply with depth of soil sampling. Soil samples high in organic matter are difficult to classify by texture due to the influence of organic colloids on the apparent settling of soil particles. It is recommended to test soils that are previously unknown, or for which depth information is lacking and when management practices, tillage and other disturbances occur.



¹ Hydrometer Test Method: Methods of Soil Analysis American Soc. Agronomy Monograph #9 Vol 1: 43-5.1

² Bouyoucos GJ. Hydrometer method improved for making analysis of soils. Agron. J. 1962; 54:464-465.

³ The International ISSS (FAO) classes of texture differ on the upper and lower boundaries of sand – silt.