



## Physical soil properties – Exercise P01b

# TEXTURE – Ribbon method

*Reference posters n. 4-7a-8a*

### RELEVANCE

Soil texture refers to the relative proportion of the various size-groups of minerals in the soil, i.e., sand, silt and clay. Texture influences soil water retention and availability, soil structure, aeration, biodiversity and regulates nutrient supply. A better knowledge of soil textural class enables an approximate assessment of the total water-holding capacity of the soil, one of the major drivers of crop production. Assessment by feel is possible through the ribbon method (USDA-NRCS)<sup>1</sup>.

### MATERIALS

Trowel



Water

### PROCEDURE<sup>1</sup>

1) Take a handful of soil, around 25 grams, wet the soil and start mixing until the soil feels moldable. If too wet, add some dry soil and if too dry, add some more water.



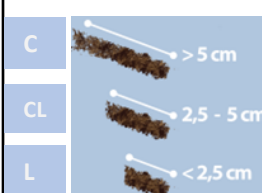
2) Form a ball of about 3 cm in diameter. Can the soil form a ball? If not, then the texture is Sandy (Coarse textured). If it is possible to form a compact ball, continue the manipulation.



3) Try forming a ribbon by placing the soil between your thumb and index finger and squeezing the soil upwards to form a ribbon. Can the soil form a ribbon? If not, then the texture is Loamy sand (Coarse textured)



4) If the soil can form ribbons, assess how long can they can get. If the ribbon breaks at 2.5 cm or below, the soil is a type of loam (L). If the ribbon is between 2.5 and 5 cm, it is a type of clay loam (CL). If it reaches over 5 cm, then it is a type of clayey soil (C).



5) Take some of the soil, wet it, handle at the palm of your hand, and determine whether the soil feels gritty, smooth or neither gritty nor smooth. Assess what type of loam, clay loam or clay by feel (see Table 1).



Table 1. Texture by feel			
	Does the soil feel gritty?	Does the soil feel smooth?	Neither gritty nor smooth?
TYPE OF LOAM	Sandy loam (Coarse textured)	Silt loam (Medium textured)	Loam (Medium textured)
TYPE OF CLAY LOAM	Sandy clay loam (Fine textured)	Silty clay loam (Fine textured)	Clay loam (Fine textured)
TYPE OF CLAY	Sandy clay (Fine textured)	Silty clay (Fine textured)	Clay (Fine textured)

ADVANTAGES OF THE METHOD	Visual method that do not require specific tools. This method can be used in all climates and soil types.
LIMITATION OF THE METHOD	Might require some training on handling soil and forming the cylinder. It is not possible to determine the relative percentages of the various size-groups.
QUESTIONS TO BE ADDRESSED	Was it possible to handle the soil to form a ball? Was it possible to form a cylinder? How long was the cylinder? Were you able to make a solid curve? How do you think drainage and nutrient retention would be different in sandy and clayey soils compared to the other soil types?

EVALUATION EXAMPLES		
Coarse	Medium	Fine
Coarse particles are felt in the soil, which prevent cohesion. Coarse textured soils are often dry, poor in nutrients and drain very fast.	The soil is a mix few coarse particles and some fine particles.	The soil is very smooth and sticky. It has a good fertility and assimilation of nutrients but it can form impermeable layers.
POOR	MODERATE	GOOD
This textural class is a limiting factor for the soil. It can be too coarse and not retain water or too fine and difficult to work.	The textural class is not a limiting factor for the development of roots, and for the circulation of water and air.	The soil has a texture that allows the assimilation of nutrients and high fertility, and does not present limitations for root development.

<sup>1</sup> <https://www.nrcs.usda.gov/sites/default/files/2022-11/texture-by-feel.pdf>