

Determining soil texture using the ribboning technique

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Soil texture refers to how coarse or fine a soil is: that is, how much sand, silt and clay it contains. Texture has a major influence on how much water a soil can hold. Generally, the smaller and finer the soil particles (the more silt and clay), the more water a soil can hold (but this water may not all be available to the crop).

Soil texture can be estimated by hand, using the ribboning technique, but it takes practice to produce a consistent result.

Assessing soil texture

Carry out this ribbon test on a sample from each layer identified in the soil profile.

1. Take a small handful of soil.



2. Add enough water to make a ball. If you can't make a ball, the soil is very sandy.



3. Feel the ball with your fingers to find out if it is gritty (sand), silky (silt) or plastic/sticky (clay).



4. Reroll the ball and with your thumb gently press it out over your forefinger to make a hanging ribbon.



5. If you can make a short ribbon, your soil texture is loamy, a mixture of sand and clay.



6. The longer the ribbon, the more clay is in your soil.



Do this several times for confirmation and compare the average ribbon length with those in Table 1.

Table 1. Soils textures using the ribboning technique

SAND
Coherence nil to very slight, cannot be moulded; single grains adhere to fingers; nil to slight turbidity when puddled.
LOAMY SAND
Will form a ribbon to 5 mm. Slight coherence; definite turbidity when puddled in palm of hand
CLAYEY SAND
Will form a ribbon 5 to 15 mm. Slight coherence, sticky when wet, many sand grains stick to fingers, discolours fingers with clay stain.
SANDY LOAM
Will form a ribbon of 15 to 20 mm. Bolus just coherent and very sandy to touch; sand grains visible.
LIGHT SANDY CLAY LOAM
Will form a ribbon of 20 to 25 mm. Bolus moderately coherent but sandy to touch; sand grains easily visible.
LOAM
Will form a ribbon of about 25 mm. Bolus coherent and spongy; smooth feel and no obvious sandiness; may be somewhat greasy, as organic matter is usually present.
SANDY CLAY LOAM
Will form a ribbon 25 to 40 mm. Bolus strongly coherent, sandy to touch; sand grains visible.
CLAY LOAM
Will form a ribbon 40 to 50 mm. Bolus strongly coherent and plastic; smooth to manipulate.
SANDY CLAY and LIGHT CLAY
Will form a ribbon 50 to 75 mm. Plastic bolus, slight resistance to shearing. sandy clay - can see, feel and hear sand grains. light clay - smooth to touch.
LIGHT MEDIUM CLAY
Will form a ribbon 75 to 85 mm. Plastic bolus smooth to touch; moderate resistance to shearing between thumb and forefinger.
MEDIUM CLAY
Will form a ribbon 85 to 100 mm. Smooth plastic bolus; handles like plasticine and can be moulded into rods, moderate resistance to ribboning.
HEAVY CLAY
Will easily form a ribbon over 100 mm. Smooth plastic bolus; handles like stiff plasticine; can be moulded into rods without fracture; has firm resistance to ribboning shear.

Each soil texture is classified within a ribbon length range (for example, sandy clay loam ribbon length is 25 to 40 mm long). Therefore, once a consistent ribbon length is being produced, you can be reasonably sure that the correct soil texture has been identified.

Glossary

Bolus: handful of moistened soil kneaded into a ball

Clay: plate like mineral particles in soil with a diameter less than 0.002 mm. Also refers to a soil in which the clay particles constitute more than 35% of the mass and more than 40% silt sized particles.

Plastic bolus: handful of moistened soil able to retain its shape after moulding. Usually possible in heavy soil types. Plastic refers to the state where soil is able to be permanently deformed without rebounding or losing volume

Puddled: soil in which the structure has been destroyed by the addition of water and or tillage at high water contents. Porosity, permeability and aggregation are all reduced in puddled soils

Sand: mineral particles in soil with a diameter ranging 0.02 – 2.0 mm. Also refers to a soil in which sand particles constitute more than 85% of the mass

Shearing: The action of applying (tangential) force to material (soil). In the case of texture determination it involves pressing a ribbon out between thumb and forefinger.

Silt: mineral particles in soil with a diameter ranging 0.002 – 0.02 mm

Turbidity: cloudiness or haziness of a fluid caused by large numbers of individual particles. A measure of reduced transparency of water (or air) due to the presence of suspended material.

More information

Primefact 1362. *Determining readily available water (RAW) to assist with irrigation management.*

NSW Agriculture, 2002. *Irrigation for Horticulture in the Mallee*, NSW Department of Primary Industries

How to texture soils and test for salinity: Salinity notes No8

http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0008/168866/texture-salinity.pdf

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Based on WaterWise on the Farm Fact Sheet, Series 1: Irrigation Farm Resources 2004

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