

QUICK REFERENCE GUIDE: Assessing soil texture

An output of the 'Soil Health for Sustainable and Productive Landscapes' Project

Soil texture is the "feel" of the soil when a moist quantity is manipulated. Some soils are sticky, others will not stick together at all, and others feel "doughy" or "spongy". Some soils can be played with like plasticine. These differences in properties gave rise, in agriculture, to soils being called clays, loams or sands. Clays stick to your boots, loams are easily moulded but non-sticky, sands are not cohesive at all and cannot be moulded when moist.

When moist soil is manipulated in the hand, sands, loams and clays feel very different. You can use one of the two methods outline below to match up how the soil feels in your hand with the texture of the soil.

For more information on what texture means for your soils, refer to 'Practical Note – Soil Texture'.

You will need:

- Soil (with any coarse organic matter and stoney material removed)
- Rain water or distilled water

Preparing the soil:

1. Take a sample of soil sufficient to fit comfortably into the palm of the hand.
2. Moisten the soil with water, a little at a time, and work the water into the soil. Water is added until the soil reaches a consistency where further water added would cause the soil to stick to the hands.
3. Knead and moisten the soil until there is no further change in the soil ball - very dry clayey samples may need considerable working to break down fine aggregates. A working time of one to ten minutes may be needed depending on the material. Usually 1 - 2 minutes is sufficient.
4. The behaviour of the bolus during manipulation indicates soil texture; you can either use the ribboning method (particularly useful for assessing clay samples/soils) or the flowchart over the page.

Ribboning Method:

Attempt to make a ribbon by using your thumb to squeeze the bolus of soil over the side of your first finger - this is best learnt by demonstration. The tendency of a soil to form a thin, strong ribbon is what is known as "resistance to shearing". Using Table 1, identify which field texture best suits the behaviour of the moist bolus of soil you are manipulating. This technique can take some practice.



Table 1. Behaviour of moist bolus of soil when manipulated by hand

Texture	Behaviour of moist bolus	Approx clay %
SAND	Coherence nil to very slight; cannot be moulded; single sand grains adhere to fingers.	less than 5 %
LOAMY SAND	Slight coherence; can be sheared between thumb and forefinger to give minimal ribbon of about 5mm.	about 5 %
CLAYEY SAND	Slight coherence; sticky when wet; many sand grains stick to fingers; will form minimal ribbon of 5 - 15 mm. Discolours fingers with clay stain.	5-10 %
SANDY LOAM	Bolus just coherent but very sandy to touch; will form ribbon 15-25 mm; dominant sand grains are medium size and readily visible.	10-20 %
FINE SANDY LOAM	Bolus coherent; fine sand can be felt and heard when manipulated; will form ribbon of 15-25 mm; sand grains are clearly evident under a hand lens.	10-20 %
LIGHT SANDY CLAY LOAM	Bolus strongly coherent but sandy to touch; sand grains dominantly medium size and easily visible; will form ribbon of 20-25 mm.	15-20 %
LOAM	Bolus coherent and rather spongy; smooth feel when manipulated but with no obvious sandiness or 'silkeness'; may be somewhat greasy to the touch if much organic matter present; will form ribbon about 25 mm	about 25 %
LOAM, FINE SANDY	Bolus coherent and slightly spongy; fine sand can be felt and heard when manipulated; will form ribbon about 25 mm.	about 25 %
SILTY LOAM	Coherent bolus, very smooth and silky; will form ribbon about 25 mm	about 25 % & silt >25 %
SANDY CLAY LOAM	Strongly coherent bolus sandy to touch; medium size sand grains visible in a finer matrix; will form ribbon of 25-40 mm.	20-30 %
CLAY LOAM	Coherent plastic bolus; will form ribbon of 40-50 mm.	30-35 %
CLAY LOAM, SANDY	Coherent plastic bolus; medium size sand grains visible in finer matrix; will form ribbon of 40-50 mm.	30-35 %
SILTY CLAY LOAM	Coherent smooth bolus; plastic and often silky to the touch; will form ribbon of 40-50 mm.	30-35 % & silt >25 %
FINE SANDY CLAY LOAM	Coherent bolus; fine sand can be felt and heard when manipulated; will form ribbon of 40-50 mm.	30-35 %
SANDY CLAY	Plastic bolus; fine to medium sand can be seen, felt or heard in clayey matrix; will form ribbon of 50-75 mm.	35-40 %
SILTY CLAY	Plastic bolus; smooth and silky to manipulate; ribbon 50-75 mm	35-40 % & silt >25 %
LIGHT CLAY	Plastic bolus; smooth to touch; slight resistance to ribbon shearing between thumb and forefinger; will form ribbon of 50-75 mm	35-40 %
LIGHT MEDIUM CLAY	Plastic bolus; smooth to touch; slight to moderate resistance to ribboning shear (greater than for light clay); will form ribbon of about 75 mm.	40-45 %
MEDIUM CLAY	Smooth plastic bolus; handles like plasticine; can be moulded into rods without fracture; has moderate resistance to ribboning shear; will form ribbon of 75 mm or more.	45-55 %
MEDIUM HEAVY CLAY	Smooth plastic bolus; handles like plasticine; can be moulded into rods without fracture; has moderate to firm resistance to ribboning shear; will form ribbon of 75 mm or more.	>50 %
HEAVY CLAY	Smooth plastic bolus; handles like stiff plasticine; can be moulded into rods without fracture; has firm resistance to ribboning shear; will form ribbon of 75 mm or more.	>50 %

The Flowchart Method:

Follow the flowchart by manipulating the soil and answering each question 'yes' or 'no'.

