

South West Victoria Soil Smart Series: Texture

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What is soil texture?

Soil texture describes the proportion of different inorganic and organic material. Texture is an important soil property which influences nutrient availability, drainage, biological activity and water holding capacity. Changes in soil texture with depth is one of the main characteristics used to define topsoil depth versus subsoil.

Soil texture can be determined in the field by working a small handful of moist soil into a ball (a bolus) (as described later). This Field texture method takes account of the effect of clay mineral type, carbonates, iron oxides and organic matter, on that behaviour. Therefore, the field texture method may produce different estimates of the particle size distribution (proportions of clay, silt, fine sand and coarse sand) compared to laboratory measurements. The size range (measured as a diameter) of the different particles are:

Clay	Silt	Sand	Gravel
<0.002 mm	0.002-0.02 mm	0.02-2 mm	> 2 mm

Depending on the proportions of these particles, the soil is characterised into different texture classes. The three main categories are:

- Light-textured soil (e.g., sands and sandy loams),
- Medium textured (e.g., clay loams, sandy clay loams), and
- Heavy-textured soil (e.g., light, medium, and heavy clays).

How to assess soil texture

When a soil pit face is inspected, there will commonly be an obvious visual difference between topsoil and subsoil, in terms of structure or colour. However, when using a spade or auger, it may be more difficult to differentiate between topsoil and subsoil, so if the difference is not obvious, use soil from within the top 10cm.

Collect a small handful of moist soil. Remove any gravel, stone or organic litter.

Knead the soil to make a golf ball-sized bolus. If necessary, add water, gradually – a few drops at a time – to make it more kneadable. Stop adding water as soon as the ball starts to stick to the hand. Knead for a further minute or two.

Light-textured, sandy soil may not be cohesive enough to form a ball, but if enough clay is present to form a ball, texture class is determined by ribboning: pressing out the soil between thumb and forefinger (Figure 1). The higher the clay content of the soil, the longer the ribbon length (Table 1)

Figure 1: Using the 'ribbon' technique to determine soil texture



Table 1 : The different texture types and properties found in soils.

Ball	Ribbon	Feel	Texture
Will not form ball or ribbon	nil	Single grains of sand stick to fingers	Sand
Ball only just holds together	0.5 cm	Gritty	Loamy sand
Ball just holds together	0.5-1.3 cm	Sticky, sand grains stick to the fingers	Clayey sand
Ball just holds together	1.3-2.5 cm	Very sandy to touch, visible sand grains	Sandy loam
Ball holds together	1.3-2.5 cm	Fine sand can be felt	Fine sandy loam
Ball holds together strongly	2-2.5 cm	Sandy to touch Sand grain visible	Light sandy clay loam
Ball holds together	2.5 cm	Spongy, smooth but not gritty or silky	Loam
Ball holds together	2.5 cm	Slightly spongy, fine sand can be felt	Loam, fine sandy
Ball holds together	2.5 cm	Very smooth and silky	Silt loam
Ball holds together strongly	2.5-3.8 cm	Plastic, smooth to manipulate	Sandy clay loam
Ball holds together	3.8-5 cm	Plastic, smooth to manipulate	Clay loam
Ball holds together strongly	7.5 cm	Plastic, smooth handles like plasticine and can be moulded into rods.	Clay

Further Reading

Northcote K.H. 1979, *A factual Key for the recognition of Australian Soils* Rellim Technical Publications
Adelaide, South Australia

DPI notes series at www.dpi.vic.gov.au

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