

Getting to Know Your Garden Soil



Soil texture

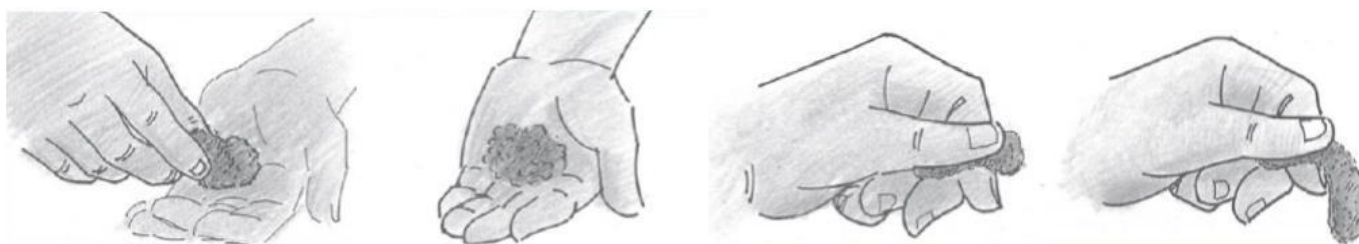
Texture refers to how a soil feels. Texture is the proportion of sand, silt and clay sized particles (that is, those less than 2 mm) that make up the mineral fraction of the soil. Soil texture is easily assessed in the field by observing the behaviour and 'feel' of a small handful of moist soil, kneaded into a ball and pressed into a ribbon. The feel of the soil ball and the length of the ribbon indicate the texture grade.

Texture influences:

- The amount of water that can be stored in the soil (water holding capacity)
- The rate of water and air movement through the soil (drainage, permeability, aeration)
- Soil nutrient supply (amount and availability)
- Ease of root growth
- Workability, trafficability (potential for compaction)
- Resistance to erosion
- Ability of a soil to maintain a stable pH

Testing soil texture

- Collect a sample of soil sufficient to fit comfortably into the palm of your hand. Check the soil for any lumps, stones or organic material. Break/ remove any that are present.
- Add water to the soil sample, a little at a time.
- Whilst adding water, knead the soil to make a small ball that sticks together and is moist.
- Knead/work the ball for a minute or two.
- Press the soil between your thumb and forefinger to make a ribbon.
- Measure only the length of the part of the ribbon that is not broken.



Soil Property	Soil Texture		
	Sandy	Loam	Clay
Drainage	High	Medium	Poor
Water holding capacity	Low	Medium	High
Aeration	Good	Medium/Good	Poor
Compaction potential	Low	Medium	High
Resistant to pH change (buffering capacity)	Low	Medium	High
Nutrient supply (cation exchange capacity)	Low	Medium	High
Ability to retain chemicals and nutrients	Very low	Low	Medium/High
Ease of cultivation	High	Medium	Low
Root penetration	Good	Good	Low

Sandy soils:

Sandy soils drain quickly and are not subject to compaction. However, they don't hold much water or nutrients. You would consider modifying your sand if your plants rapidly run out of water, your soil is water repellent, or if you need to make frequent applications of fertilisers for your plants to thrive.

Solutions include adding clay and organic matter and increasing the water holding capacity of your soil.

- a) Mixing in some clay into the top 15–20 cm will help.
- b) Mixing in lots of organic matter will do a better job as it is a slow release source of nutrients as well as a holder of water.
- c) You can improve wettability of the soil by adding clay or by using water crystals (if your soil is water repellent, consider using wetting agents which will allow water to infiltrate better).

Clay soils:

Clays ain't clays.

People ask "How do I fix my clay", "Clay is no good—what can I add to make it better", but our best cropping land is on clays. The black clay soils on the Darling Downs have a very high fertility and water holding capacity which makes them great for growing plants, but they also naturally shrink when dry, swell when wet and form cracks—which can be a challenge for gardening.

On the other hand, hard clays high in sodium are very problematic and make growing anything a challenge! Clay layers can also be found buried beneath lighter textured surface soil—these soils are called duplex soils and have their own set of problems as you're effectively dealing with two different types of soil in the one hole.

Possible problems encountered with clay soils include difficulty in digging, poor water penetration, poor root growth, waterlogging in wet weather, surface crust formation and cloddiness. These problems are caused by a lack of sand-sized particles, a high content of silt-sized particles, the types of clay minerals present, too much sodium, or too little organic matter, or a combination of two or more of these.

You would consider modifying your clay soil if water penetration into it is very slow, if it is difficult to dig, or if it sets very hard on drying.

Solutions include adding sand, gypsum and organic matter.

- a) Sand is rarely economical as you have to add large amounts to make a difference. Rather than trying to change your entire garden, try just mixing sand into the top 5 cm of soil. Try adding sand only where your plants are going to grow.
- b) Gypsum will only make a difference if your soil has too much sodium in it (there is an easy test to see if your soil has too much sodium in it—see part 3). If you do have a sodic soil (i.e. high in sodium), add gypsum to the soil surface and dig it in. Lime and dolomite can also be useful.
- c) Adding organic matter is a very good option for improving your soil.