

# SOIL MATTERS ...

... in recent years understanding has  
**grown**

Soil is the upper layer of the solid Earth and, like biodiversity, it is the product of millions of years of evolution.

Like much of our world, it is co-created by the life that it supports.

[Dr Tony Kendle, soil scientist, ex of Eden Project and Reading University]



# SOIL

## PLANTS AND SOIL

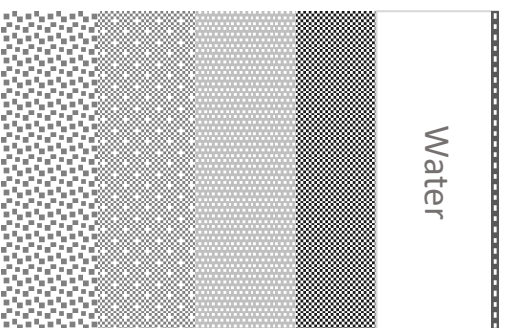
3 aspects of soil:

- Structure
- pH balance (acidity or alkalinity)
- Nutrients



# Soil structure test

- sediment layers in the jam jar:



Floating organic matter

Clay

Silt

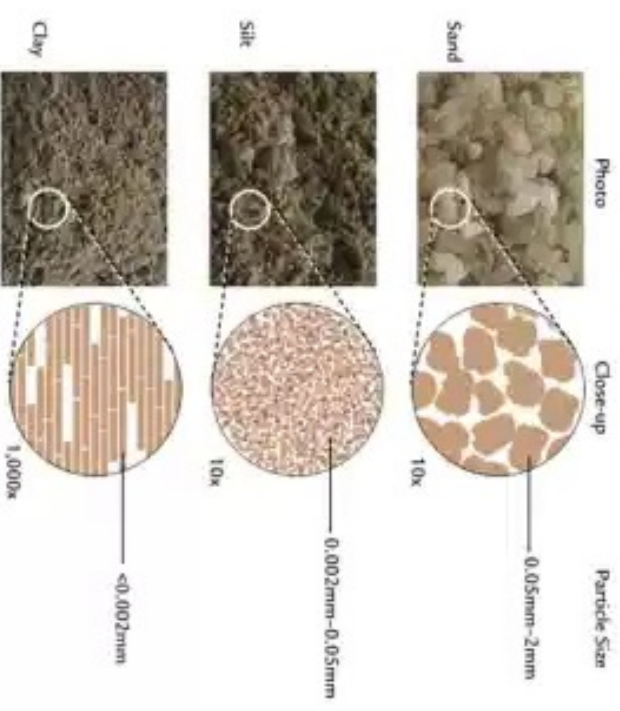
Fine sand

Coarse sand and gravel

*Quick 'hand' test: pick up a small handful of damp soil, and roll it between your hands to make a 'worm'. If it holds its shape, it is rich in clay; if it just crumbles, it is sandy.*

Scrape away the top 1cm, then part-fill a jar with the exposed soil. Add plenty of water and shake very vigorously. Leave to settle for 24 hours.

## Sand, Silt, and Clay



Note that these are at different magnifications

## Table of soil types

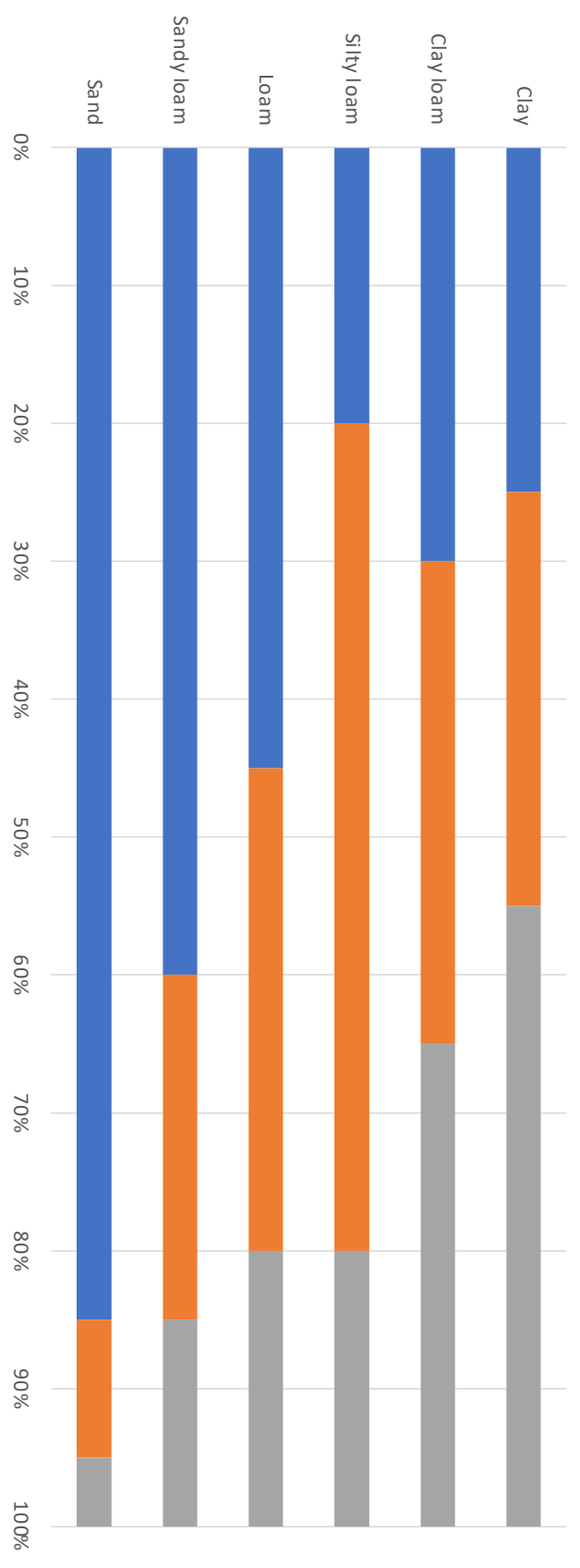
Sand

Silt

Clay

*Silt is granular material of a size between sand and clay and composed mostly of broken grains of feldspar and quartz*

## Soil structure types



# Soil pH – a simple test

Neutral soil is pH 7

6 and below is acidic soil

8 and above is alkaline soil

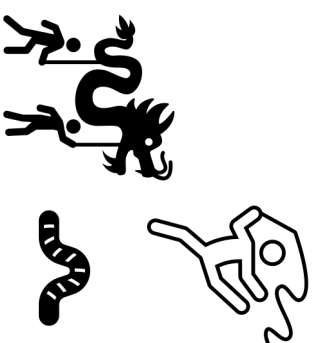
## **A quick soil check that indicates if soil is far off neutral:**

- > Put samples of soil in two clear containers
- > Add white vinegar to one, and shake or stir. If it bubbles, the soil is alkaline
- > Add baking powder dissolved in water to the other, and shake or stir. If it bubbles, the soil is acidic

If there is no distinct reaction to either, your soil is probably close to neutral



Soil is full of life



✓ A teaspoon of healthy soil contains between 100 million and 1 billion bacteria and hundreds and thousands of fungi .... a ton of microscopic bacteria may be active in each acre of soil.

✓ Soils are not just for growing, they are where essential things happen.

**BBC Ideas**  
in partnership with the Royal Society

**Why soil is one of the most  
amazing things on earth**

<https://www.bbc.co.uk/ideas/videos/why-soil-is-one-of-the-most-amazing-things-on-earth/p090cf64?playlist=made-in-partnership-with-the-royal-society>

# Key lessons

- **Like many small, precious and complex things the detailed micro structure of soils is easily destroyed.**
- Soil is an essential carbon store. Turning the soil and exposing it to air can oxidise the soil carbon allowing it to escape to the atmosphere as carbon dioxide. **The more we disturb soil, the more carbon we release.**
  - [NB: BOG is low-dig but not no-dig]
- Plant roots and soil micro-organisms live in a symbiotic relationship, each feeding the other. **Throwing artificial fertilisers and pesticides into the system ruins that delicate balance.**



Did you know that there's a natural antidepressant in soil?

**Mycobacterium vaccae** is the substance under study which has been found to mirror the effect on neurons that drugs like Prozac provide.

The bacterium is found in soil and may stimulate serotonin production, which makes you relaxed and happier.

Most avid gardeners will tell you that their landscape is their 'happy place' and the actual physical act of gardening is a stress reducer and mood lifter. Lack of serotonin has been linked to depression, anxiety, obsessive-compulsive disorders, and bipolar disorders. The bacterium appears to be a natural antidepressant in soil and has no adverse health effects. These antidepressant microbes in soil may be as easy to use as just playing around with your soil.

Read more at Gardening Know How: Antidepressant Microbes In Soil:  
How Dirt Makes You Happy

<https://www.gardeningknowhow.com/garden-how-to/soil-fertilizers/antidepressant-microbes-soil.htm>

