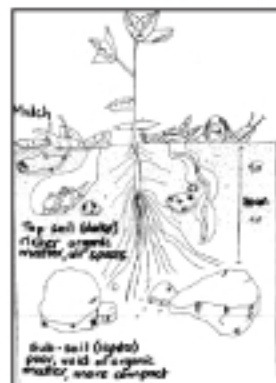


Soil is formed by the breakdown of parent rock. The type of soil formed depends on the type of rock as well as the size of the particles.

SOIL PROFILE SHOWING SOIL LAYERS



Topsoil: is the upper layer of the soil containing organic matter and air spaces from which the plant gets water and nutrients.

Subsoil: is the soil layer below the topsoil that is more compact and nutrient poor.

Soil types

There are 3 main types of soil:

1. Sandy soil: does not hold water well as it filters through too quickly, so plants need more frequent watering.
 2. Silt soil: the very fine rock or sand particles make for a poor soil structure that can be improved by adding organic matter.
 3. Clay soil: holds water for long periods. If roots of plants remain in waterlogged soil for long periods of time, they can die.
- Adding compost to the above soils will improve the aeration and water holding capacity.
 - Sand particles are larger than silt particles, which in turn are larger than clay particles.
 - Loam soil is a mix of sandy and clay soils, and holds water well while allowing air to circulate through. It contains organic matter and micro-organisms which keep the soil healthy.

Improving your soil

Whatever your soil type (sand, clay or loam) you can improve its quality and water holding capacity by adding compost. It provides food for soil organisms such as earthworms. This encourages earthworm activity, which improves soil aeration and water penetration. Compost also enriches the soil with nutrients. Sandy and clay soils tend to be nutrient poor as nutrients are leached away. Adding compost will improve the moisture holding capacity as well as nutrient content of such soils. Organic mulch can also be applied as it will release nutrients as it breaks down. Adding organic fertiliser alone is not a long term solution to improving your soil, you also need to increase the soil organic matter. By improving your soil you are able to save money on fertilisers and your water bill as healthy soil re-

Compost can easily be made using kitchen scraps such as vegetable peels, newspaper and grass clippings or leaves that have fallen in the garden. Compost can also be used as a mulch and reduces evaporation of moisture from the soil. The main requirements of a compost heap are air and heat. First lay down a 15–20 cm layer of dry “brown” material such as dead plants or dry leaves. The next layer also has a depth of 15–20 cm and consists of softer, greener lawn trimmings, kitchen waste etc. These layers should be alternated to a height of approximately 1.2 m and 1.2 m wide. Soil should be placed on the top to keep the heat in. Compost heaps can be warmed by adding compost from an old compost heap, keeping it moist or adding manure. However, human, dog and cat manure should not be added.



Green material Brown material

Mulch

Mulches conserve water in the soil. There are 2 types of mulches, organic and inorganic. Organic mulches are those that come from plant and animal sources such as bark chips, leaves, or strawy manure. Inorganic mulches include plastic sheeting, pebbles and gravel. These do retain moisture in the soil but do not provide nutrients as they break down. Inorganic mulches increase the heat in the soil, so place these types around low water plants.



Examples of mulching on pathways

Fertiliser

Fertilisers are applied to improve plant growth and can be applied in 2 ways. Firstly by spreading granules on the ground so the nutrients are absorbed by the roots or by spraying a liquid fertiliser that is absorbed by plant leaves. Organic fertilisers provide nutrients for the soil as well as raw material for soil organisms to break down. Chemical fertilisers provide nutrients that are artificially produced from inorganic materials. Salt is used as the carrier for the fertiliser and these salts can have negative impacts on the soil in the long term. Using an organic fertiliser is the preferred option for a more environmentally friendly practice.

Beneficial organisms including bacteria, nematodes, protozoa, earthworms, mycorrhiza and fungi are found in the soil. These organisms are essential for plant growth as they help to convert organic matter and soil minerals into the nutrients that plants require. By regularly weeding, mulching and feeding your soil compost or organic fertiliser, you provide optimal conditions for these organisms. These helpful organisms keep the pests away so maintain the soil in optimal conditions for these helpers.



Water retention capacity

Sandy soils have larger particles and more spaces in between than the fine particles of clay and loam, thus water infiltrates faster through the sandy soil than the loam soil. Clay soils are more compact, so water will infiltrate slower. Clay soil should be loosened often in order to speed up infiltration. Adding compost will improve the water-holding capacity of sandy soils, and the aeration of clay soils.



Water infiltration through clay soils is slower.

Irrigation for soil types

The soil moisture level should be checked first by placing your finger in the soil before watering.

Sandy soils should be irrigated frequently with small amounts of water so that water does not infiltrate too deeply but rather stays in the root zone of the plant. For clay soils, irrigate on and off over a period of time so that water is able to slowly seep into the soil. Loam soil is the easiest to irrigate as water stays in long enough for the plants to use it but not so long that soil gets waterlogged.