SOIL MANAGEMENT
FOR HORTICULTURALISTS
SOIL PROFILES AND HORIZONS

CALU DEVELOPMENT FARM FACTSHEET
April 2010

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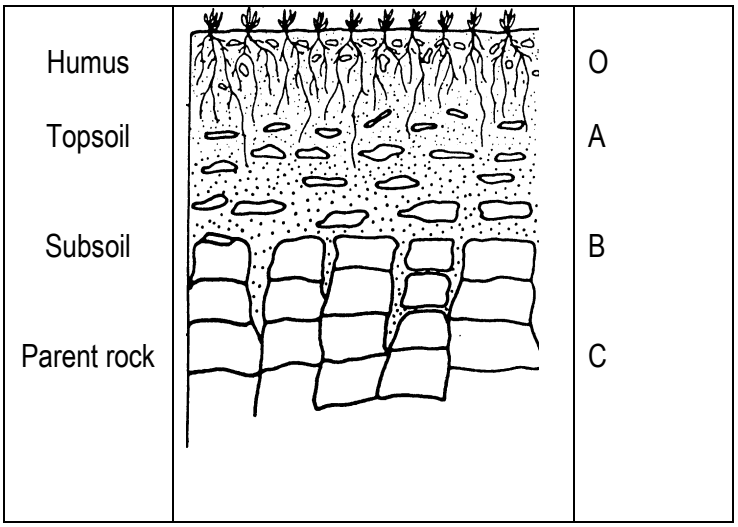
This factsheet provides a very brief and simplified overview of the main characteristics of soil profiles.

SOIL PROFILE

A soil profile is a vertical section through the soil. It can show the following:

- The amount of top soil.
- The amount of sub soil.
- Possibly the underlying rock type.
- The level of the water table.
- Whether there are any impervious layers within the soil (panning).

The different horizontal layers that are exposed are known as horizons.



The major soil horizons

General characteristics of soil horizons

Top soil	Subsoil
Usually darker than the subsoil • Consists of small lump like crumbs. • It is the most fertile part of the soil. • It contains most of the soil organisms. • Contains most of the soil's organic matter. • Usually dark in colour due to the presence of organic matter. • It contains most of the plant roots. • The depth may vary from a couple of cm to 50cm.	• Consists of large lumps. • Contains some soil organisms. • Contains little or no organic matter. • Usually lighter in colour than topsoil. • May contain some roots usually tree or large shrub roots. • May vary widely in depth.

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SOIL ORGANIC MATTER

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SOIL ORGANIC MATTER
Organic matter (OM) is derived from the dead and partly decomposed remains of plant and animal life and the excreta of animals.

Soils with a low OM content tend to have poor structural stability and are more liable to erosion. High OM content in peaty soils generally indicate lower levels of biological activity which may be due to poor drainage or a low pH.

Organic matter provides essential nutrients for plants when decomposed and is a major source of nitrogen. The physical condition of soil is significantly improved by the addition of organic matter. In natural situations, soil organic matter is continually replenished. In cultivated areas the cycle of organic matter replacement is often interrupted and the fertility of the soil will drop if organic matter is not added.

The breakdown of organic matter in the soil
The breakdown of organic matter is very complex and involves many stages and a wide range of organisms that live in the soil. These include:

- Large insects, earthworms and moles which contribute by eating other animals and consuming live or dead plant remains. They then excrete the remains.
- Fungi grow and feed on excreta and on other dead materials. They are important in the breakdown woody materials.
- Bacteria take part in the final decomposition of organic matter, converting it to simple chemicals including nutrients that can be re-used by the plant.

Humus
Humus is formed when soil organic matter is fully decomposed. It is important for maintaining soil fertility and structure. Humus is a colloidal material with a high cation exchange capacity (CEC), it can make a major contribution to the retention of exchangeable cations, especially in soils low in clay content. Humus adheres to mineral particles to encourage soil aggregation and therefore improve workability.

Characteristics of humus

- It is very dark in colour and is resistant to further decomposition.
- It attracts and holds some plant nutrients, preventing them from being leached from the soil.
- It can hold 80 – 90% of its own weight in water.

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