



From the GROUND UP

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The foundation of any successful garden - ornamental or productive - is the health of the soil

Soil is the essential foundation for your flourishing landscape and is more complex than it might appear. It's important to work with the soils and topography that exist on your site and to keep your soil healthy. If you do so you will be rewarded with healthy plants, increased water retention and an improved microclimate. By working with your site's topography, less excavation is needed and landscape features can be designed to sit within the landscape rather than looking like they have been plonked onto it.

Knowing your soil type

The first step is to find out what soil type you have. A landscape designer or horticulturist can easily make some simple observations and a perform a pH test to see how acidic or alkaline the soil is, or on a more complex site request a laboratory test to get a detailed report on the chemical and nutrient makeup of your soil. If you want to do your own testing, there are test kits you can buy from garden centres or online.

Knowing your soil type is important because

your soil type will determine what plants you should select. Some plants will perform better on well-drained sandy soils, some on clay soils. A soil's pH affects the ability of plants to take up nutrients. Some plants are adapted to alkaline soils while others are adapted to more acidic soils. A landscape designer or horticulturist will be able to advise you of the most suitable plants for your soils.

Maintaining a balance

Soil is a living, breathing element made up of a combination of rock particles, humus (organic matter), air, water, nutrients, plant roots, micro-flora and other living organisms. When you squeeze the air out of soil by compaction, if it gets waterlogged or if you use chemicals such as fertilisers or pesticides, you can damage the delicate balance of your soil's structure and in turn take the life out of your soil.

Worms, ants, micro-flora and plant roots all help to keep your soil structured and alive by creating pore spaces for air, decomposing humus and making nutrients available for plants. By encouraging living organisms to

flourish in your soil you will take the hard work out of creating healthy soil as these little guys do the work for you.

A little known fact is that a plant will get all of its oxygen from the soil. Yes, plant roots breathe underground! When you compact soil it becomes a problem because the pore spaces where air collects are removed. Decompacting soil is very hard work and usually involves costly manual labour. It's best to prevent compaction to begin with to save the cost of decompaction.

1. *If you want a flourishing garden, you need to build on a good, well-balanced foundation of healthy soil. Photo courtesy of Gardens by Design.*

2. *Some plants like acidic soil while others prefer it to be alkaline. Azalaeas, for example, like soil that is on the acidic side. Photo by Diane Norris.*

3. *Some plants are very fussy about soil while others, such as the daisy, can often tolerate a wide range of soils. Photo courtesy of Ramm Botanicals.*



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Improving soil health

A healthy soil has a constant soil moisture level that is not too dry and not too damp. To encourage this balance, incorporate organic compost into your soil and cover the soil's surface with organic mulch. Too much water or waterlogging will remove air from the soil and can cause root rot or fungal problems. If your soil regularly gets waterlogged, you can rectify this by installing surface or subsurface drainage.

Soil needs organic matter for the organisms and the plants to grow vigorously and to remain healthy. Organic matter must be well composted - if it is not well composted too much organic matter builds up and the soil

can become hydrophobic, which blocks water from being absorbed into the soil. When ready to add to your soil, composted organic matter from your kitchen scraps and garden clippings will look like damp, rich, dark soil and will be full of worms. Compost is naturally nutrient-rich so can act as an organic fertiliser or soil conditioner encouraging micro-flora to grow.

Organic fertilisers or pesticides are the best way to increase your soil's fertility or control pests because they are generally less concentrated and naturally occur in the environment and will not upset your soil's delicate balance. Chemical fertilisers and pesticides are generally more concentrated and made up of a mixture of chemicals that do not naturally exist in the environment. Because of this, they are more likely to leach into surrounding areas or kill the soil micro-organisms.

Working with top soil

If you have shallow soil or if your soil has been removed, topsoil may need to be added. When importing topsoil, it should comply with the relevant Australian Standards otherwise it may be untested, contain weed seeds and/or other contaminants.

If your site has recently been built on, your soil will probably be compacted, contaminated and may even have fill from somewhere else. Avoid planting directly into such soil. If this is the case, you will need to ameliorate your soil to make it suitable for plants to grow in.

When planning for cut and fill earthworks make sure your top soil is kept separate from your subsoil. If subsoil is placed on top of topsoil, a perched water table can be created, which means big drainage problems. Your excavation contractor should stockpile the topsoil separately to the subsoil and cover it to prevent weed seeds falling onto it. The sooner the soil is spread back over the ground, the sooner life in the form of micro-organisms, worms and so on can move back in and work



GETTING THE PH RIGHT

This whole business about pH may seem complicated, but it isn't really. One way of discovering the pH in your area is to observe what is growing. If azaleas, rhododendrons and camellias are thriving, the soil is likely to be on the acidic side. Blue hydrangeas signal the same message. Another is to use a pH testing kit.

It is important to have an indication of your soil's pH as it will influence your choice of plants. It's no use growing lime-hating species in alkaline soils. If you have purchased topsoil, this may vary from the norm in your district and will need to be tested.

Getting the soil right can be the hardest thing to judge for gardeners. With a home test kit you will be able to test for (N) nitrogen, (P) phosphorus and (K) potassium. The instruction booklet will take you through the process of collecting a soil sample, combining it with a few drops of liquid formula and comparing the result to a colour chart. You can then use this information to purchase the most suitable soil amendments so you can grow healthy, productive plants.

The addition of lime or dolomite to the soil will reduce acidity by raising the pH. The quantity required depends on soil type, the amount of organic matter in the soil and the existing pH level. The pH is lowered by the addition of sulphur, iron sulphate or aluminium sulphate. Digging in plenty of organic matter also helps.



to improve soil health.

Soil problems can be very costly if you don't get it right, especially once the works have been completed. Replacing dead plants or turf, soil amelioration and drainage rectification are all very expensive. A member of the Australian Institute of Landscape Designers & Managers (AILDM) can help you plan your landscape works and provide solutions to help you avoid the problems that may appear long after your contractor has moved on.

This article was prepared by Jacki Brown and the team at ecodeign on behalf of the AILDM. If you would like to find an AILDM member in your area, visit the website: www.aildm.com.au. ■