

Soil Fertility and Organic Growing

Successful organic gardening has its foundation in maintaining a garden ecosystem which is both stable and healthy. A key component of that ecosystem lives within the soil. When the soil ecosystem is healthy and well nourished there is little need for the gardener to “correct” soil nutrient deficiencies or imbalances. A healthy soil ecosystem results in healthy plants.

Background

It was probably Lord Northbourne in his book *Look to the Land*, published in 1940, who first used the term ‘organic’ to describe a particular approach to farming and gardening. It was his view that in order to maintain soil fertility over a long period of time so that high quality food can be produced sustainably it is necessary for the farm or garden to have “... a biological completeness; it must be a living entity, it must be a unit which has within itself a balanced organic life” (Northbourne, 1940, p 58). It is in this sense of the garden or farm as a biologically complete whole that the term ‘organic’ is applied to the COGS approach to gardening.

Sir Albert Howard, one of the ‘fathers’ of modern organic farming in his book *An Agricultural Testament* (Howard, 1940, p 31) stated, “The key to a fertile soil and a prosperous agriculture is humus”. It is the soil life which breaks down organic matter into humus and maintains the functioning of the nutrient cycle on which all life depends. For a garden to be sustainable there must be a balance between the processes of growth and the processes of decay. Whatever is removed from the soil as produce must be returned to the soil at approximately the rate at which it is removed. In practice this is achieved through composting (the decay process). It creates the humus essential for maintaining that healthy soil ecosystem responsible for the recycling of nutrients in a form accessible to our plants.

Maintaining Soil Fertility Organically

The most important factor in producing healthy, tasty crops is to build up the fertility of your soil. Artificial fertilisers consist of a wide range of manufactured, highly soluble, chemicals used to feed the plants. These chemicals are easily leached out of the soil resulting in pollution problems for our waterways. Organic growers feed the soil with organic matter - manure, compost and organic mulches. This organic matter feeds the myriad of soil micro-organisms and encourages earthworms. These make available a wide range of plant nutrients and in time produce a rich vibrant soil. Nutrients made available by this process have the advantage of being much less easily leached out of the soil and therefore less polluting to waterways than artificial fertilisers. Only healthy soil will produce healthy and prolific crops.

The value of worms can’t be emphasised enough. Worms live on the organic matter in or on your soil. They process it for you by eating it and then providing worm casts which contain a wide variety of nutrients in a form easily available to plants. At the same time they aerate and break up the soil as they tunnel around looking for food.

Compost

Compost is a most wonderful material. Good compost is all that is needed to fertilise the garden. It is, after all, what nature uses in the natural forests of the world. It is the source of the humus which Sir Albet Howard considered to be the key to fertile soil.

Any organic matter, material which was once living, will break down eventually in the composting process and the nutrients it contained will become available for re-use by your plants. Composting is simply the recycling of organic matter. Compost gives a never-ending circular supply of all the nourishment that the soil needs to grow strong and healthy vegetables - and its free!

Compost will be only as good as the materials which go into it. A variety of materials is needed to give a balance of nutrients: grass clippings; kitchen waste; leaves; weeds; manure; hair, mouldy bread; meat scraps; egg shells; sawdust (from untreated timber); tissues; vacuum cleaner dust; feathers, twigs. The list goes on and on. As the materials become available, put them either into a covered compost bin or make a pile in the open air. Whichever method is used, it is essential that the bottom of the bin or heap is open so that soil micro-organisms and worms can enter the compost. Water the heap from time to time to provide sufficient moisture for correct composting. If it is an open-air heap, try to turn it over regularly to hasten the decomposition process. As the material starts to decompose it becomes quite hot. This is a sign that it's curing well. As it cools down, the worms will come to finish off the recycling process. When the heap is cold and the material completely broken down, apply it to the soil and start planting.

Mulching

This is a technique which many organic growers use and which they find particularly effective. Mulching reduces evaporation, stops wind erosion and keeps the soil surface moist and friable.

Mulch is any organic matter which covers the soil. In a natural forest for instance nature covers the bare earth with leaves, twigs and bark and they lie undisturbed, left to decay and in turn nourish the soil. These form a natural mulch. Organic growers, realising the benefits of such a process, endeavour to reproduce these conditions in their own vegetable gardens. To do this they use a variety of organic matter:

Hay: This is one of the best mulches to use, particularly if second or third-cut lucerne can be obtained. Lucerne is rich in nutrients as its deep roots take up minerals and other nutrients not available to more shallow-rooted plants. When the lucerne is cut and placed on the garden, these minerals are then transferred to the soil as the hay slowly decomposes. Second or third-cut is better than first-cut which often has a large percentage of meadow grasses. If a source of hay is not available, consult the "Pets, Livestock" column of the Canberra Times. Often spoilt hay is available which has already started to decompose. This is cheaper and equally effective.

Leaves: These make very good mulch. They are akin to the natural mulch found on the forest floor, they have many nutrients. A few trailer-loads gathered in autumn it will save buying hay in the summer.

How to Mulch

The next step in the mulching process is to place it on your vegetable garden. First ensure that the soil is well watered. Divide the bale of hay into pads and place these directly on the soil so that all the bare earth is completely covered - the thickness of the mulch will depend on how much material you have and how big the plants are. Leave a little space around the stems of the plants to reduce the possibility of fungal problems. When planting seedlings, simply move aside the mulch to leave a couple of centimetres free of hay around each plant.

Advantages of Mulching

Weed Control: Mulch inhibits the growth of unwanted plants which find it difficult to make their way up to the sunlight through the mulch. Those that do emerge will be spindly and shallow-rooted and are easily pulled out. Place these unwanted plants on top of the mulch so they in turn will add to it.

Water Conservation: A good layer of mulch will greatly reduce the amount of soil moisture lost to evaporation. Watering of a mulched garden is best done by drip irrigation so that water penetrates more readily to the soil rather than being sprinkled on the surface of the mulch.

Temperature Control: On a hot day, if the layer is lifted up, it will be found that the earth underneath has remained cool. Similarly, on a cold morning the temperature of the soil under the hay is well above the air temperature. This ensures that plants are subject to a more constant root temperature which, in turn, aids their growth.

Worms: Worms love mulch because it creates the conditions under which they thrive - damp, dark, even temperature. Pick up any pad of mulch and the worms will be found doing their work - aerating and nourishing the soil. This makes digging the garden superfluous.

Nutrients: As the mulch slowly decomposes it provides valuable nutrients and organic matter to the soil.