

GARDENING ORGANICALLY IN COGS COMMUNITY GARDENS

INTRODUCTION

As organic gardeners we seek to produce food which is both plentiful and nutritious. This requires that we provide the nutrients and environment needed for our plants to thrive. These conditions are achieved by using gardening methods which minimise disruptions to the interactions amongst those living organisms which comprise the garden environment. Collectively, the life processes of those organisms comprise the nutrient cycles within the garden upon which the health of our plants depend.

It was probably Lord Northbourne in his book *Look to the Land*, published in 1940, who first used the term ‘organic’ to describe this 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, a whole which comprises the interacting ecosystems of soil, plants, insects and animals (including the humans who depend on the farm for food), that the term ‘organic’ is applied to the COGS approach to gardening.

The principles of organic gardening have their foundation in the techniques necessary to develop and maintain a garden ecosystem which is both stable and robust. The key feature of organic gardening is that the garden ecosystem upon which it relies is largely self-sustaining over a long period of time so that there is little need for the gardener to "correct" nutrient imbalances in the soil or imbalances amongst ecosystem populations which may lead to pest and disease problems. Sir Albert Howard, one of the ‘fathers’ of modern organic farming in his book *An Agricultural Testament* identified this condition of balance within and amongst the farm or garden ecosystems with soil fertility (Howard, 1940, p 31): “*Soil fertility is the condition which results from the operation of Nature’s round, from the orderly revolution of the wheel of life, from the adoption and faithful execution of the first principle of agriculture—there must always be a perfect balance between the processes of growth and the processes of decay. The consequences of this condition are a living soil, abundant crops of good quality, and livestock which possess the bloom of health. The key to a fertile soil and a prosperous agriculture is humus*”.

The balance between the processes of growth and the processes of decay (sometimes referred to as the law of return) lies at the core of COGS approach to gardening. For a garden to be sustainable, 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, which 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

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 soil. They process organic matter 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 the 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 Albert 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 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 provide 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 is 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 and if a few trailer-loads are gathered in autumn it will not be necessary to buy hay in the summer.

How to Mulch

The next step in the mulching process is to place it on the 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 there is 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 hay 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.

ORGANIC PRINCIPLES

While humus applied to the soil through compost and mulch lies at the core of organic gardening, the health and sustainability of the totality of the ecosystems related to the gardening environment (above and below ground) should not be ignored. The health and sustainability of the ecosystems of the broader garden environment are the basis of the gardening principles

applied in COGS Community Gardens. These principles are articulated in the National Standard for Organic and Biodynamic Produce (July 2007). The Standard states:

The basic aim of an operator complying with this Standard is to achieve optimum quantities of quality produce, while enhancing the sustainability of natural agricultural resources.

Emphasis is placed on management practices, use of renewable resources, the need for conservation of energy, soil and water and the maintenance of environmental quality.

The principal objectives of the certified operator include:

- *the production of food of high nutritional value.*
- *the enhancement of biological cycles in farming systems.*
- *maintaining or improving fertility of soils.*
- *working as far as practicable within a closed system by minimising the use of non-renewable resources.*
- *the avoidance of pollution resulting from agricultural practices and processing.*
- *the co-existence with, and the protection of, the environment.*

The aims and objectives outlined above are achieved through management practices that create soils of enhanced biological activity, as indicated by the humus level, crumb structure and feeder root development, such that plants are fed through the soil ecosystem and not, principally, through soluble fertilisers added to the soil.

These general principles are applied in all COGS community gardens.

APPLICATION OF ORGANIC PRINCIPLES IN COGS COMMUNITY GARDENS

The practical application of these general principles in COGS gardens requires gardening practices which emphasise:

- the use of renewable resources;
- conservation of energy, soil and water;
- recognition of livestock welfare needs; and
- maintenance or enhancement of environmental quality.

These practices allow the production of optimum quantities of produce without the use of artificial fertilisers or synthetic chemicals. Their practical application are outlined below.

Maximising the use of renewable resources

Where possible biodegradable products are used, for example, straw mulches rather than plastics, and materials are recycled. However, this does not mean plots should be allowed to become rubbish tips. Any recycled products used on plots should be relevant to the plants the plot holder is growing. Plots should be kept neat and tidy at all times and should not be used for storing material not used for gardening.

Conservation of energy, soil and water

By growing our own food at home or in a COGS community garden we reduce the 'food miles' of the food we consume. While this may not directly affect the quality of our food, it contributes

to a broader ecological sustainability through the minimising the use of fossil fuels for both transport and the process of growing food.

Soil is the most precious resource in our gardens. An abundant and diverse soil life is the basis of good organic gardening. It is the interaction of the myriad of populations of soil organisms which results in the breakdown of soil organic matter into soluble nutrients in a form suitable for uptake by plant root systems. The health of this soil ecosystem is essential to maintain the fertility of the soil suitable for our garden plants. The use of composts and green manures to increase soil organic matter and to feed soil organisms, and through them our plants, is essential to the success of organic gardening. Organic matter and soil organisms also maintain and enhance soil structure so care must be taken not use cultivation techniques which destroy that structure. Many Canberra soils are quite fragile in this regard.

While we aim to conserve our own soil we do not encourage the plunder of other landscapes in an attempt to “improve” our soil by buying in top soil from landscape suppliers. Apart from the Queanbeyan garden which is built on compacted gravel in an old railway yard, the natural soil can be successfully managed to produce good quality organic produce in all the other gardens.

The practice of water conservation is also an important aspect of organic gardening. Water conservation is achieved by mulching and other techniques. To minimise water use and at the same time maximise production it is essential to match the varying plant water needs at the different stages of a plant’s growth cycle to the watering regime. See COGS handout *When to Water* for more information on water requirements of some of the common plants.

All COGS gardens are subject to the ACT water restrictions and these must be complied with at all times. For more information go to <http://www.actewagl.com.au/> and follow the links to the current water restrictions.

Livestock

Livestock are an essential part of a complete organic system, however, it is not practicable to keep livestock in most COGS community gardens because of the urban environment in which they are located and the difficulty of maintaining adequate care, supervision and security for the livestock. But some gardens do allow the keeping of a limited number poultry. It is essential that all poultry enclosures meet ACT government regulations and that regular and adequate food and water are supplied to meet livestock needs. Poultry enclosures must also meet COGS rules for structures outlined in the general garden rules.

Environmental maintenance and enhancement

A diverse and balanced soil ecology contributes to the success of the garden in two ways. It results in the decay of organic matter into a form whereby the plant nutrients become soluble in the soil water so that they can be readily absorbed through plant root systems. However, probably more important for many plants are the nutrients made available more directly through symbiotic relationships amongst various forms of soil life and root systems, two of the most significant being the nitrogen-fixing *Rhizobium* bacteria which coexist symbiotically with legume roots and *Mycorrhizas*, symbiotic associations of a fungus and a plant root. This ensures

that the plants are well nourished and healthy. Healthy plants are much better able to utilise their own defence mechanisms against pests and diseases.

The importance in organic gardening of nurturing and enhancing soil life through the use of compost and manures was referred to above. Inappropriate gardening practices can quickly and severely damage that soil life and upset its ecological balance. It is the maintenance of ecological balance both within and above the soil environment which is crucial to minimising pest and disease problems in organic gardening systems. Even the use of chemicals permitted under the national organic and biodynamic standards can severely damage the ecological balance within a garden and lead to the development of severe pest and disease problems. For example, Bordeaux mix, which is permitted under the national standards, if allowed to run onto the soil is extremely toxic to earth worms and beneficial soil fungi. Similarly, pyrethrum and derris dust, both allowed under the National Standard, if used indiscriminately, can destroy the beneficial insects which keep many garden pests under control. While these organically acceptable pest and disease control methods are available to organic gardeners they must be used with discrimination if severe upsets to the ecological balance are to be avoided and more harm than good caused by their use.

Great care is needed to ensure our gardening techniques do not damage the ecological balance within our garden and between the garden and its surrounding environment. Pests and diseases do attack our plants from time to time and must be dealt with. To minimise damage to the ecological balance within our gardens that our pest and disease control efforts might cause, all gardeners are encouraged to practise integrated pest management.

CONCLUSION

The quality of produce grown in COGS Community gardens has demonstrated the practicality of applying organic principles to grow nutritious and plentiful fruit and vegetables in an environmentally sustainable manner in an urban environment.

FURTHER READING

Balfour, Lady Eve. *The Living Soil*, The Soil Association, 2006

Howard, Sir Albert. *An Agricultural Testament*, The Other India Press, 2004

Howard, Sir Albert. *The Soil and Health: A Study of Organic Agriculture*, Kentucky University Press, 2006

Lord Northbourne. *Look to the Land*, 2nd Ed, Sophia Perennis, 2003

Martin, D.L. and Gershuny, G. *The Rodale Book of Composting*, Rodale Press, 1992

Fitter, A.H. and Hay, R.K.M. *Environmental Physiology of Plants*, Academic Press, 1981