Spring 2005

Canberra Organic

ORGANIC GROWING IN THE CANBERRA REGION

The quarterly publication of the Canberra Organic Growers Society Inc.

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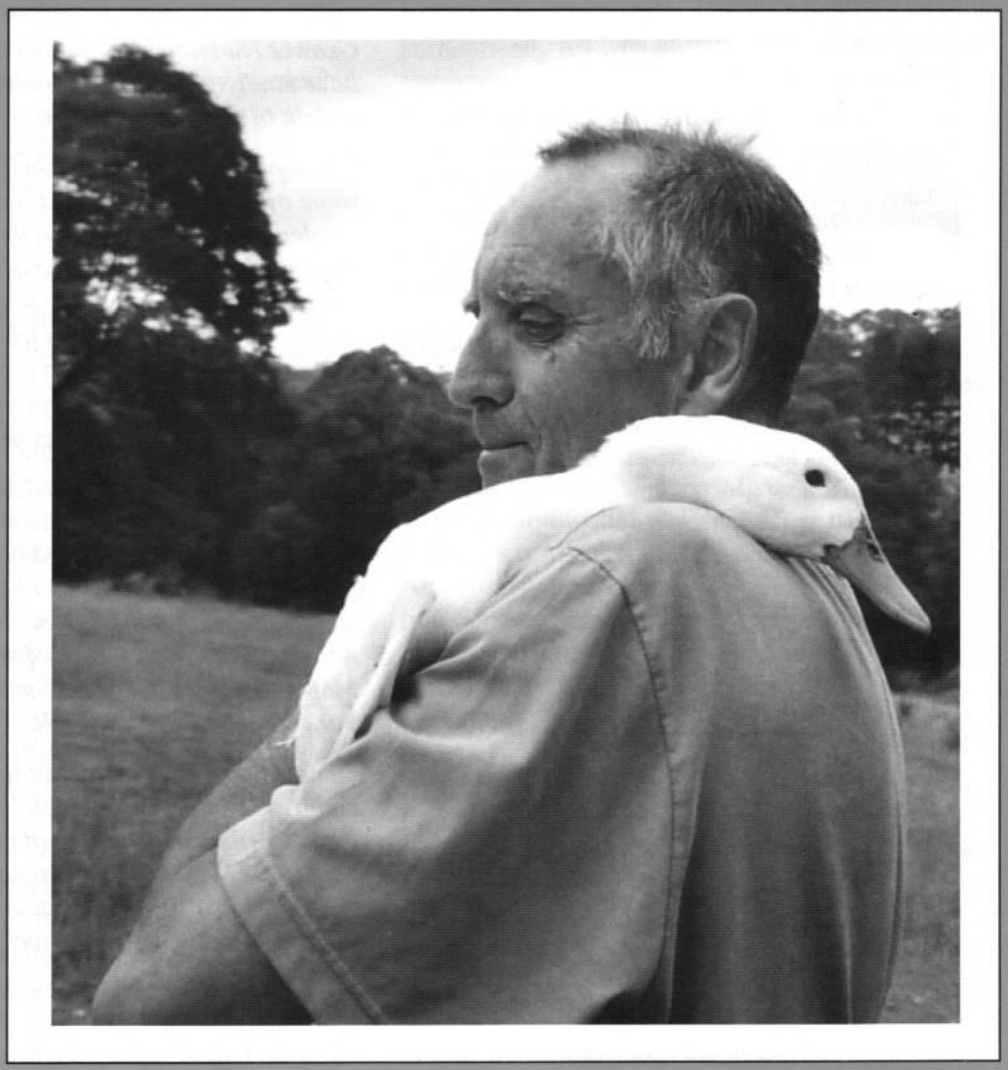

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EDITOR:
Janet Popovic

ADVERTISING:
Contact Janet Popovic 62582811
Email: editor@cogs.asn.au

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From the Editor

Thank you COGS members for again providing lots of interesting material—we have a bumper issue for you covering local news, innovative garden projects, and essential information about organic gardening. Thank you also for sending in more of your photos to support this material.

Many of you will recognise COGS member John Allen on our cover—John and Margaret's story and photos are on pages 20-21. We have some very substantive information on the importance of soil and soil life in organic gardening. Firstly we are publishing part one of a two part article "Soil and Organic Gardening" written by our former President Keith Colls. Many of you will know that Keith regularly conducts beginner organic gardening courses for COGS. Part 2 will be published in our next issue but in the meantime we have included Sandra Norman's article "The Soil Food Web". Sandra wrote the article for Hunter Organic, the magazine of the Hunter Organic Growers Society Inc. and she and Hunter Organic have kindly given us permission to reproduce the article in our magazine.

Graham Walker from Mitchell garden has given us some outstanding contributions for innovative garden projects (pages 18-19) as well as providing what we hope to be the first of a series of caption competitions—up to you to respond (page 27)! Another innovative project from Charnwood garden is reported on page 27 and it's in keeping with the interest stimulated by recent items on problems with couch grass (see also pages 8-9 and 30).

Queanbeyan 'railyard' garden is our featured community garden—the Queanbeyan gardeners' enthusiasm is demonstrated by the story and the photos of their very productive summer (pages 8-9 and 27) and we welcome further items from Kambah garden (page 28). Our immediate past President Martin Butterfield has sent us material from New York as promised (page 29).

Summary information about the 15th IFOAM congress coming up in Adelaide is on page 25 and Betty Cornhill has written about her experiences at past IFOAM events to encourage you to participate (pages 24-25). If you are staying at home, there are plenty of events needing your support (pages 3, 28, 35)

Enjoy your magazine,

Janet Popovic

From the President
Spring 2005

With Spring almost here it is time once again to get busy in the garden. Fortunately we have had good winter rains this year resulting in greatly improved soil moisture levels at the start of the main growing season. Hopefully these will be followed by at least average Spring and Summer rains. Over the next few weeks it is not too late to plant onion seedlings, peas, broad beans, spinach or a Spring crop of quick growing Asian greens such as pak choy or mizuna. By mid September carrot, beetroot, silverbeet and lettuce seeds can be planted and well mulched potatoes can go in. Even though it's tempting on warm sunny days to plant available seedlings, frosts are a real possibility for the next month or two and frost tender crops such as beans, tomatoes, pumpkins and sweetcorn should not be planted out in Canberra before late October or early November. Green manure crops which are starting to go to seed should be cut and can either be dug in or left on the surface as mulch to encourage earthworms.

Plot fees for 2005 - 2006

At the joint meeting of the committee and the garden conveners held on August 2nd it was decided that plot fees for the coming year would remain unchanged at $1 per square metre. Each garden will be holding its annual meeting during September (see the notice on p35 for details). If you are unable to attend your garden's meeting to pay your plot fees please remember that all plot fees are due by September 30th. Any plots which have not been paid for by then may be re-allocated. The annual garden meetings also elect garden conveners and garden committees for the following year. If you enjoy gardening in one of the COGS community gardens why not consider volunteering for one of these positions?

Water restrictions

I would like to remind members with plots in the COGS gardens that ACTEW **water restrictions do apply in the gardens**. Excuses like 'oh I forgot' or 'I've just planted some seedlings' aren't good enough. Stage 2 restrictions are currently in force and it is probable that Stage 3 restrictions will again be introduced this Summer. Please make sure that you adhere to the allowed watering hours and the rules for the use (or not) of sprinklers. COGS rules also forbid any unattended watering in the gardens i.e. if sprinklers, drippers or weeping hoses are used you must be present for the entire time that they are on.

Down to Earth Festival & CIT Plant sale

COGS will be holding stalls during the Spring at the Down to Earth Expo at the Lake Tuggeranong College on September 11th, and in conjunction with the annual CIT Plant sale at COGS Backyard on November 12th. These events are a great opportunity to spread the 'organic' word, distribute information sheets, recruit new members and sell plants and seedlings to raise some money for COGS. Committee members are currently growing seedlings for the Down to Earth Expo but it would be appreciated if some other members could grow a few punnets each for the CIT sale day on November 12th. If you are able to do this could you please let me or a committee member know so that we can coordinate activities.

Monthly meetings and Guest Speakers

So far this year we have had an interesting variety of guest speakers each of whom has drawn their own crowd. The committee has begun considering speakers for next years monthly meetings and would welcome suggestions from members of speakers they would like to hear. As you may know the Griffin Centre is moving in mid September, so we expect the September meeting will be held in the new building which is across the road from the current one. We don't have a room number as yet but will have people on hand to direct you on the night.

Finally on behalf of COGS I would like to welcome Sophia Williams to the COGS committee and hope she enjoys her time with us.

Adrienne

Adrienne Fazekas

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Front cover photo: John Allen with Goldie, see article pages 20-21. Photo supplied by John Allen

Back cover photos: Winter compost heap Left to right - Day 1, Day 6, Day 60, Day 90. Photos by J Popovic

Organic Gardening for Beginners Course

The next beginners gardening course will be held on Sunday afternoons **commencing 6 November**. The course will be run by Keith Colls, former President of COGS and will be conducted at COGS Backyard, Xeriscape Gardens, Weston.

All enquiries should be directed to CIT Solutions on 6207 4441

Around the Gardens

Charnwood
There are a couple of vacancies at Charnwood garden. New developments include a hothouse powered by manure, and one gardener's couch removing machine—see page 17.
Stephen Dangaard

Cook
We've enjoyed the rain and the broad beans in particular are doing well. There are currently no vacancies at Cook garden and we have 3 people on the waiting list. *Alan Robertson*

Cotter
There is a vacant plot at Cotter.

Erindale
As per usual our garden activities have been pretty quiet during the winter months. This year I thought I'd leave a crop of rocket to do its own thing and was pleasantly surprised how the plants survived and thrived in the drought and then the harsh winter conditions. Although rocket is priced at around twelve dollars a kilo I have been able to pick bagfuls. It's interesting how rocket has grown in popularity as a cooking ingredient as well as a salad green. Some people think that rocket is a spicy variety of lettuce but it is actually a culinary herb containing mineral salts, glucosides, and is rich in vitamin C. Dried rocket is used medicinally to increase energy, aid digestion; it has diuretic properties and if frequently consumed is supposed to be a potent aphrodisiac.

As I planted too many seedlings my spring onions are so huge that from a distance they could easily be mistaken for a crop of leeks. I should make a concerted effort to use them up by adding them to dishes or as a substitute for cooking onions. The leeks too are doing well and are very useful for hearty winter soups and stews not to mention the simple though delicious side dish of leek béchamel.

Erindale community garden is on the scrounge for carpet so if you have any old unwanted pieces it would be much appreciated if it was sent our way. We have a boysenberry vine and some old (though still useful) edging planks to give away. To arrange collection please phone Christine 62315862 or email: ccarter@netspeed.com.au *Christine Carter*

Holder
The recent rains have inspired both "old" and new gardeners alike. We have had several new gardeners join us at Holder over the winter months. The enthusiasm and activity of our newer members is wonderful, and they are attacking couch grass and other weeds with gusto and preparing beds for spring and summer plantings. Other gardeners have crops of winter brassicas, leeks, leafy greens and green manures, while some are anticipating good harvests of garlic, potato onions, spring onions and long-keeping onions later this summer. A few are looking forward to spring flowers such as white alyssum (to attract beneficial insects) and fragrant matucana sweet peas.

Now that the days are lengthening it's time to think, dream and plan for the upcoming seasons; to get out the seed packets and jars, sort through them and decide what to sow so that it is ready for transplanting into our plots when the frosts are less severe and the soil is warmer. We all dream of bumper summer crops of tomatoes and basil and other tasty home grown vegetables.

In early autumn 2006 Holder will be amongst the gardens "open" for other COGS members to come and see just what we are growing and how we are doing it. So it will be interesting to see just how "bumper" our vegetable patches are and if they match our plans. Looking at others' gardens and seeing how they do things is always interesting and inspiring.

Thanks are due to those members who have helped us by installing and/or repairing our new taps near the fruit tree plantings and just inside the front fence, and by removing abandoned posts/star pickets and bed edgings so that vacant plots were less daunting for new gardeners.

We now have only one single plot available and a waiting list for double plots. If any current garden members no longer wish to have a plot in the next gardening period, which starts on 1st September, please let us know as soon as possible. Also some who have double plots may wish to consider whether they really need such a large area. We are still receiving enquiries about plots. Happy gardening.
Jane Andrews & Jen Johnston, co-conveners.

Kambah

Where have all the Kambah gardeners gone? Ah yes, it is Winter. They must have all gone into hibernation!! I expect that these beautiful creatures called "gardeners" are staying underground, regenerating their energy levels in readiness for a Spring onslaught. After all this wonderful rain (for which I hope everyone has said a big "Thankyou God"), how can anyone stay away from their plots for long? I have noticed, however, that a couple of huge truck loads of horse manure have been delivered to the garden, some mulch has appeared on a couple of plots, and some weeding has been done. There must be some emergence from hibernation!!

Mary Coulson has been working on our plot which comes under the label of "seed plot". After growing some great pumpkins on a "wind row", with Mary Ormay, during our Summer months, Mary Coulson has been busy planting permanent produce for sharing with other gardeners and encouraging new gardeners. Great work Mary. While we have heaps of vacant plots, and no prospective new members, it has been too difficult to operate the "seed plot" as a seed plot.

A number of our plots are being reduced in size and/or manageability due to encroaching tree roots from the large trees in our garden. During the drought, the roots rapidly spread thickly into some plots. These plots will need to be re-measured for determining the useable area for calculation of plot fees.

We currently have 7 vacant plots in addition to our "seed plot". Unfortunately, we expect four additional vacancies after the end of September. Happy Gardening. *Shirley Irvin*

Shirley is stepping down as convener due to other commitments. Thanks Shirley for all your past efforts, including the regular enjoyable contributions to this column. Ed.

Northside

Most gardeners at Mitchell have devoted half their plots to winter vegetables and the other half to green manure at this time of year. The winter vegetables have been surprisingly productive—with broccoli and cabbage being the favourites. The winter rains and somewhat mild temperatures have provided everybody with a reasonable harvest, even those who planted a little too late. The garden has a wonderful touch of green thanks to the recent rains. But we will need to get busy with the mower come Spring if we are to avoid a waist-high jungle of grass once the warmer weather and longer daylight hours return.

We welcome three new gardeners since the last issue. One gardener has joined because the possums are devouring everything in her backyard vegetable plot. She won't have to worry about possums at Mitchell—just the birds! Another has taken a large holding in order to grow enough healthy food to supply his young family. He is also constructing a sizeable chook run to keep his family supplied with fresh meat and eggs. Our final new gardener has taken a 100sqm plot abandoned to couch. His doctor told him to get more exercise—digging up that much couch will certainly keep him fit. We wish him well.

The dozen or so fruit trees have been pruned for the first time in many years. They were reduced in size to accommodate netting this year. We weren't particularly experienced in the

Ben Bradey hoeing, Richard Larson tending tall beans, at Mitchell. Photo by G Walker.

pruning business but I'm sure the trees will survive at our hands. A couple of dead trees were removed to make way for new plantings—maybe an olive or hazelnut just for something different.

Currently we have two plots around 100sqm each available to garden immediately. There is a third plot of 100sqm infested with couch if anybody feels they need some extra exercise to get rid of it. *Ben Bradey*

Queanbeyan

See the feature story about Queanbeyan community garden on pages 8-9, 27.

Maree Timbs, currently convener of Queanbeyan garden, is handing over to Cormac Farrell. Thanks Maree for your valued contributions, and welcome to Cormac. Ed.

Queanbeyan 'railyard' community garden

The last summer growing season was a great one for the Queanbeyan garden despite the water restrictions, with a bountiful harvest of summer vegies, fruits and berries. As always, Julian's fantastic plot was the envy of all, with an array of mini-greenhouses and cold frames being installed to boost the already impressive production of fruit, vegetables and berries.

The Queanbeyan Railyard garden gets its name from the past life of the site – it was an old rail cargo transfer station, which has now been converted by Queanbeyan City Council into a community area complete with a sheltered playground, basketball courts and a community garden! The garden itself is in a great position, easily visible from Henderson Road and next to a main cycle path, providing a good showcase for organic gardening.

Production – it's not just about food

The layout of the garden provides for individual plots in the centre, with the communal herb beds, compost heaps and green manure beds on the perimeter. Between the individual plots and the communal beds there is a surprisingly wide variety of fruit, vegetables and berries grown, including asparagus, red currants, raspberries, strawberries, corn, beetroot, capsicum, watermelon, and calendulas. Of course, the staples such as beans, carrots, lettuce, pumpkin and tomatoes (several varieties of each) remain the bulk of production. This diversity has encouraged a healthy trading culture within the garden, and I still have some of the Purple Congo potatoes that I traded for my French beans earlier this year.

Those gardeners growing capsicum in particular have had an extremely good year. We will attempt to prise the secrets for growing their amazing yields from their secretive owners in time for the next issue of the magazine.

However, the garden is not just about food. Several plots also include flowers in amongst the vegetables, providing a welcome splash of colour to the garden, as well as providing a valuable encouragement to insect predators. The standout performers this year have been Maree's Carnations, as well as Calendulas, Nasturtiums Feverfew and Lavender in other plots.

Weed & Pest Control

We are fortunate to have very few pest and disease problems within the garden, which is partly due to sensible crop rotation within the plots as well as the fact that the garden is quite separate from any nearby sources of pests and diseases. Apart from a brief influx of grasshoppers, we have had a pretty clear run.

One strange quirk is the lack of bird damage, which I notice is a problem in other gardens. There are reasonable numbers of birds around, but for some reason bird damage to fruit and vegetables is a rare event. Obvious bird magnets such as raspberries and currants still need to be netted, but so far other targets such as strawberries have been mostly left alone.

Like most other gardens, we continue to struggle against the influx of couch grass, which seems to thrive in the hard, dry soil between the plots. Various solutions were employed to defeat the couch, but the most successful involved laying recycled conveyor belts from the local sawmill between the plots, which were then nailed down to smother the runners.

The main advantage of this system is that when the inevitable runners sneak up around the edges, you simply peel back the conveyor belt and rip as much of the runner off as you can get to. Growing under the matting makes the runners much softer and easier to rip up as well. This has eliminated the couch problem from every bed that has used it, and the conveyor belts provide some insurance against re-infection

from surrounding areas. Unfortunately, eradicating couch grass from the garden is unlikely to be possible anytime soon, but we have managed some measure of control. The couch won't give up, of course, but then again neither will we!

I noticed that other community gardens do not allow couch runners to be put into compost heaps. We do put these in to our heaps, but it requires some careful management. The couch and other weeds are placed in black plastic garbage bags and left in the sun to kill them, and are then cut up and fed into the compost heaps as they are turned. The very aggressive composting process used (sandwich method) generates a lot of heat, which ensures that there is a 100% kill rate. To date, we haven't had any problems with this approach, but turning one of the older heaps that had a lot of uncut couch runners in it is not an experience that I am keen to repeat!

Composting

At the beginning of the year, the perimeter of the garden was dominated by a series of old compost bins that were filled with several season's worth of dried out weeds, clippings, corn stalks and other garden cast-offs. While these provided a lot of 'brown' materials, there was almost nothing in the way of the 'green' waste materials like kitchen scraps, green manures etc that are essential to drive the composting process. There had been basically no breakdown in the piles at all, and they were also a definite fire hazard. At the Queanbeyan garden, the compost heaps have been constructed from old pallets and other scrap timber, giving us three sets of three bins, with one spare.

The re-construction of the heaps took around three to four months, and involved pulling each heap out of its bin and stacking it to one side. The heap was then re-built with coarse materials like corn stalks on the bottom to provide airflow, followed by layers of vegetable scraps, manure, blood and bone and worm compost sandwiched between layers of brown material. The worm compost was added as liquid slurry to spread much needed water and nutrients through the dry material.

The first thing that we noticed when the heaps started to compost properly was that there was a huge amount of heat generated, particularly when they were first re-built. This heat (combined with regular turnings) is essential to give a complete kill of weeds and their seeds. As mentioned above, the bins are divided into groups of three throughout the garden, and as one 'fresh' bin begins to cool, it is forked over into the next bin, and the process starts again. One bin out of the three is always kept empty to provide space to fork the adjacent bin contents into. After about 2 to 3 turnings, some dolomite and comfrey leaves are added to finish off the composting, and after another 2 to 3 turnings the compost is ready to use. It is amazing how quickly a cubic metre of compost disappears once the "Compost Ready" sign is placed on top.

How do we know when to turn the heap? You just (CAREFULLY!) feel with your hand inside the heap, to see how hot it is. I am not kidding about being careful – a well constructed heap can be hot enough to scald naked skin. If it is cool, the heap needs another turning to start things off again. If not, then it is still cooking. As always, be careful when working the heaps to lift with the legs, not your back when forking over the heaps. The re-working of the heaps has been a great success, and the 10 heaps now produce around one cubic metre of rich, biologically active compost per month.

The only significant problem we have had with the heaps was a sudden influx of mice in late spring. However, this was quickly followed by regular visits from one of the local owls, which decimated the mouse population and provided a rare treat for those gardening into the early evening!

continued on page 27

Soil and Organic Gardening Part 1

Organic gardening consists of much more than just avoiding the use of synthetic fertilisers, pesticides and fungicides. Appropriate soil management lies at the heart of the method. By maintaining a healthy soil life, an adequately watered and well structured soil so that the natural processes of recycling plant nutrients can take place, plants are able to grow successfully, and in most cases cope with pests and diseases, with very little interference by the gardener.

Soil Basics

For plants to grow well they require their roots to be continuously supplied with balanced proportions of water, air and plant nutrient elements. These needs are met when the five main components of soil *viz*, mineral particles, organic matter, water, air and living organisms, are present in appropriate proportions. For a typical well drained garden soil these proportions are shown below.

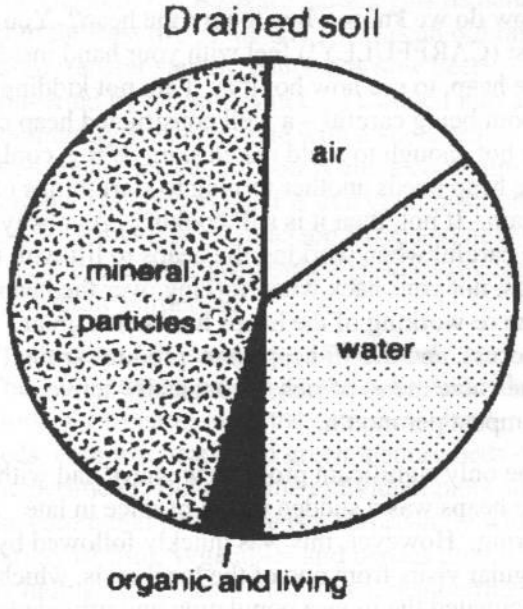


Figure 1: Proportions of the five main components of a well drained garden soil.

The activity of the gardener can have a significant impact on the proportions within the soil of all its components. For example, the water content of the soil depends on watering patterns, drainage, evaporation (mulching), organic matter content, soil structure etc. The amount of air in the soil also depends on soil structure and can be dramatically reduced through soil compaction and waterlogging. Plants suffer when the amount of water and air (oxygen) available to their roots is out of balance. A compacted soil also inhibits the development of the plant roots through restricting the plant's ability to push its roots through the soil and restricting the root's ability to access the oxygen necessary for growth.

The amount of organic matter in the soil depends on gardening techniques such as the use of green manure crops, the manner of working the soil, composting and mulching etc and the number of living organisms depends on the amount of food (organic matter in the soil), the pH, the techniques used for working the soil, damage caused by sprays and fertilisers used. These factors also influence the number of beneficial organisms and disease-causing organisms which can be supported by the soil and the balance between them. Soil life is also crucial to maintaining a constant supply of plant nutrients through its role in converting organic matter into forms available for plant use and in sustaining mutually beneficial symbiotic relationships between plant roots and certain bacteria and fungi. Soil acidity not only affects the balance between bacterial life and fungi, it also affects the availability of plant nutrients which can be accessed by the plant roots from soil water.

Clearly organic gardeners need to monitor the condition of the soil carefully to ensure that it is in optimum condition to maintain plant growth.

Soil Characteristics

Soil properties can be categorised into three groups:

- Physical properties such as soil texture and soil structure;
- Chemical properties such as acidity, salinity, sodicity etc which are related to the chemical processes which affect the availability of nutrients to plants and soil life.
- Biological properties related to the health of the soil macro and micro-organisms.

These properties are not independent. They interact. For example, the biological activity of earthworms can change physical properties of the soil through aeration and the improvement of soil structure. Bacterial activity can change chemical properties through the release of plant nutrients. Chemical activities can have a major impact on physical properties, for example the use of gypsum to improve the structure of clay soils,

and high acidity inhibiting some forms of biological activity.

The role of the gardener is to understand the soil properties of the garden and to ensure that the soil is in such a condition that the plant's nutrient needs can be met throughout its life cycle. By appropriate soil management practices the organic gardener can achieve optimal physical, chemical and biological soil properties for the particular plants being grown.

Physical Properties

From a gardening perspective, it is useful to have a good understanding of the texture and structure of our garden soil to ensure appropriate gardening methods are used to provide optimum conditions for our plants. For example, a very clayey soil will need to be treated differently to a sandy soil. Considerable care is needed to avoid compaction of a clayey soil but this is not such a problem with a sandy soil. On the other hand a sandy soil is more likely to be lacking in nutrients and it may be necessary to add much more organic matter to sandy soil. The sandy soil will also be more susceptible to leaching and less able to store water requiring more care to avoid loss of nutrients and pollution of nearby streams through over-watering.

Soil texture can be regarded as the "feel" of the soil. By rubbing some soil through our fingers we can feel whether it is gritty, smooth and silky or somewhere in between. This "feel" of the soil depends on the relative amounts of sand, silt and clay which comprise the mineral component of the soil. Sand is the coarsest material and clay the finest. The relative sizes (not actual sizes) of the mineral components of soil are illustrated below.

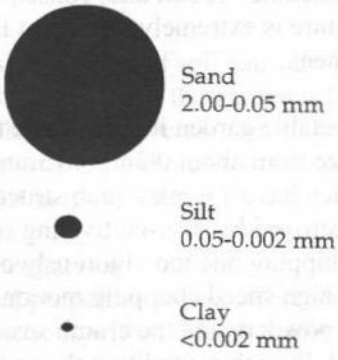


Figure 2: Relative sizes of particles of the mineral component of soil.

There is a universal system for categorising soils according to these relative amounts. It is summarised in the diagram below.

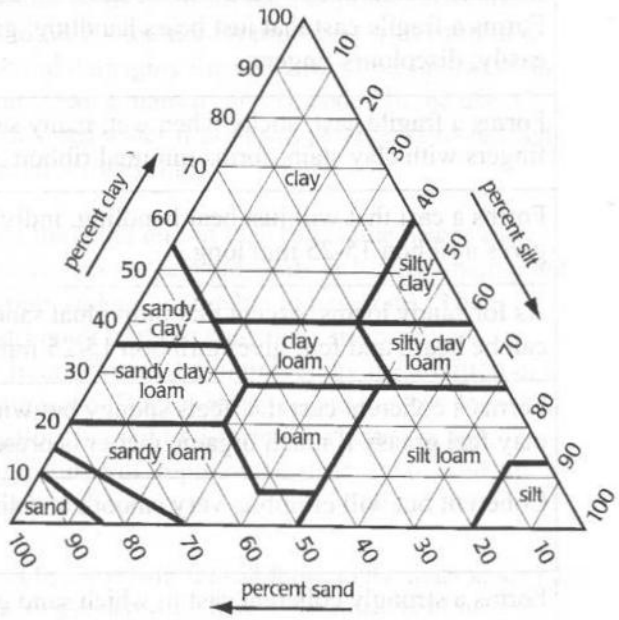


Figure 3: The soil texture triangle

There are various methods available for determining which texture category a soil belongs to. The method below, taken from Handreck and Black, is a simple but standard method the home gardener can use. Other methods are also described in this book and references such as the NSW Agriculture's *SOILPak for Vegetable Growers*.

Assessing Soil Texture

1. Take a small sample of soil sufficient to fit comfortably in the palm of one hand. Discard obvious pieces of gravel.
2. Moisten the soil with water, a little at a time, and knead until there is no apparent change in the way it feels. Kneading will break aggregates so that they are no longer felt. This may take several minutes. The moisture content should be such that the soil just fails to stick to the fingers.
3. Inspect the sample to see if sand is visible; if not, it may still be felt and heard as the sample is worked.
4. Next squeeze the sample hard to see whether it will form a ball or cast, and if so, whether the cast is durable or falls apart readily.
5. Finally, squeeze it out between the thumb and forefinger with a sliding motion and note the length of self-supporting ribbon that can be formed and compare with the table over the page.

No coherence; cannot be moulded; single grains stick to fingers.	Sand
Forms a fragile cast that just bears handling; gives a short (6 mm) ribbon that breaks easily; discolours fingers.	Loamy sand
Forms a fragile cast; sticky when wet; many sand grains stick to fingers; discolours fingers with clay stain; forms minimal ribbon 5-15 mm long.	Clayey sand
Forms a cast that will just bear handling; individual sand grains can be seen and felt; gives a ribbon 15-25 mm long.	Sandy loam
As for sandy loams, except that individual sand grains are not visible, although they can be heard and felt; gives a ribbon 15-25 mm long.	Fine sandy loam
Forms a coherent cast that feels spongy but with no obvious sandiness or `silkiness'; may feel greasy if much organic matter is present; forms a ribbon about 25 mm long.	Loam
Coherent but will crumble; very smooth and silky; will form a ribbon 25 mm long.	Silty loam
Forms a strongly coherent cast in which sand grains can be felt; forms a ribbon 25-40 mm long.	Sandy clay loam
Forms a coherent cast with a rather spongy feel; plastic when squeezed between thumb and forefinger; smooth to manipulate; will form a ribbon 40-50 mm long.	Clay loam
Forms a plastic cast, except that sand grains can be seen, felt or heard; forms a ribbon 50-75 mm long.	Sandy clay
Smooth plastic cast; slight resistance to shearing between thumb and forefinger; forms a ribbon 50-75 mm long.	Light clay
Smooth plastic cast, handles like plasticine and can be moulded into rods without fracture; some resistance to ribboning; forms a ribbon 75 mm or more long.	Medium clay
Smooth plastic cast that handles like stiff plasticine; can be moulded into rods without fracture; firm resistance to ribboning; forms a ribbon at least 75 mm long.	Heavy clay

To a large extent soil texture must be taken as a given by the gardener. It is very difficult, and expensive, to change the texture and probably not necessary. On the other hand soil structure can easily be enhanced (or destroyed) by the gardener through simple techniques and is usually more significant from the perspective of root penetration through the soil and water infiltration and retention.

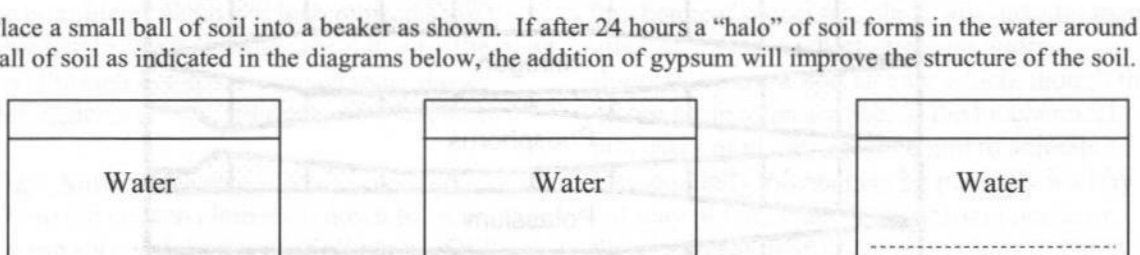
Soil structure is characterised by the way the soil particles (sand, silt and clay) stick together to form crumbs or aggregates of various sizes. These crumbs (called peds) come in all shapes and sizes and the spaces between them provide the pore spaces through which roots, water and air can penetrate the soil and, consequently, good soil structure is extremely important for plant development.

For a vegetable garden it is desirable to aim at a crumb size from about 0.2mm to 3mm across. Soils which have a weak crumb structure are easily destroyed by over-cultivating such as by using a chipping hoe too vigorously or a rotary hoe with high speed chopping motion. The soil becomes powdery and the crumb structure is destroyed. In such a condition the soil is very difficult to wet. However, when it does become wet, if it experiences foot or other traffic it can be easily compacted, particularly if there is a reasonable clay content.

The strength of the crumb structure can be enhanced by the addition of organic matter and worm castings. It is not the organic matter itself which improves the soil structure but the slimes produced by soil microbes as they feed on the organic matter and the slimes which are produced in worm guts that hold the worm castings together. These slimes hold the soil particles together to form the crumbs. The hyphae of soil fungi (the sticky bands through which the fungi get their food) also play an important role in holding the soil crumbs together. The presence of clay, iron and aluminium and exchangeable calcium tend to enhance crumb formation but for the organic gardener probably the most effective method is to add organic matter to ensure a healthy and vigorous soil life and minimise the use of hoeing. The presence of exchangeable sodium tends to decrease the strength of the crumb structure so the use of bore water or dam water collected from the salt prone areas around the ACT should be approached with caution to avoid damaging the soil structure. Likewise, in an urban situation care is needed in the use of recycled water if high salt detergents have been used for washing.

At the other end of the scale some heavy clay soils form large solid clods or lumps which plant roots and air are unable to penetrate. The structure of these soils may, in some circumstances, be improved by the addition of gypsum. The Emerson dispersion test described below is used to determine whether or not gypsum will improve the structure of a heavy clay.

Place a small ball of soil into a beaker as shown. If after 24 hours a "halo" of soil forms in the water around the ball of soil as indicated in the diagrams below, the addition of gypsum will improve the structure of the soil.



If after 24 hours there is no dispersion of soil particles, gypsum will not improve this soil.

If after 24 hours there is a slight dispersion of soil particles, gypsum will improve this soil slightly.

If after 24 hours there is a very noticeable dispersion of soil particles, gypsum will improve this soil greatly.

Figure 4: Emerson's dispersion test to determine the likely efficacy of gypsum to improve the structure of clay soil.

The physical properties of soil can vary greatly from place to place and if the garden is large it is often advisable to dig several holes to get an overall picture of the soil profile, structure and texture of soil in the garden.

Chemical Properties

The chemical properties of soil affect the chemical reactions within the soil which release plant nutrients in a form which plants can take up through their root systems.

All nutrients are usually present in the soil to some extent but the proportions of each can vary widely according to the nature of the parent rock from which the soil was formed and the history of the soil since its formation (eg whether it has been subject to severe leaching).

Nutrient requirements of plants can also vary widely, eg some have a high phosphorus requirement while others have a low requirement. This can result in a particular soil being ideal for one type of plant but may produce nutrient deficiencies or toxicities in another type of plant. Plant nutrient requirements also vary according to the stage of a plant's life cycle. Consequently, it is important that the gardener understands the nutrient needs of the plants being grown, how those needs change during the various stages of

its life cycle and whether or not the soil can meet those needs. It is also useful to be aware of the chemical properties of the soil which affect nutrient availability and to be able to recognise the effects on plant growth of a lack or an over-abundance of various nutrients.

Controlling Soil Acidity

One of the simplest chemical properties of soil is the measure of its acidity or its pH. pH is a measure of the concentration of positively charged hydrogen ions (cations) in the soil. It has a scale of 0 to 14 where 7 is neutral, that is neither acidic or alkaline. Less than 7 is acidic and greater than 7 is alkaline. The pH scale is logarithmic which means a pH of 4 is ten times as acidic as a pH of 5 and one hundred times as acidic as a pH of 6. Acidity and alkalinity affect the chemical reactions which occur in the soil so that for some values of soil pH certain chemical nutrients which a plant requires may become chemically bound up in an insoluble compound and therefore unavailable to the plant, even though a soil test may indicate an abundance of the nutrient in the soil.

The following diagram shows the change in the availability of various plant nutrients as pH changes even though the overall amount of the particular nutrient elements do not change.

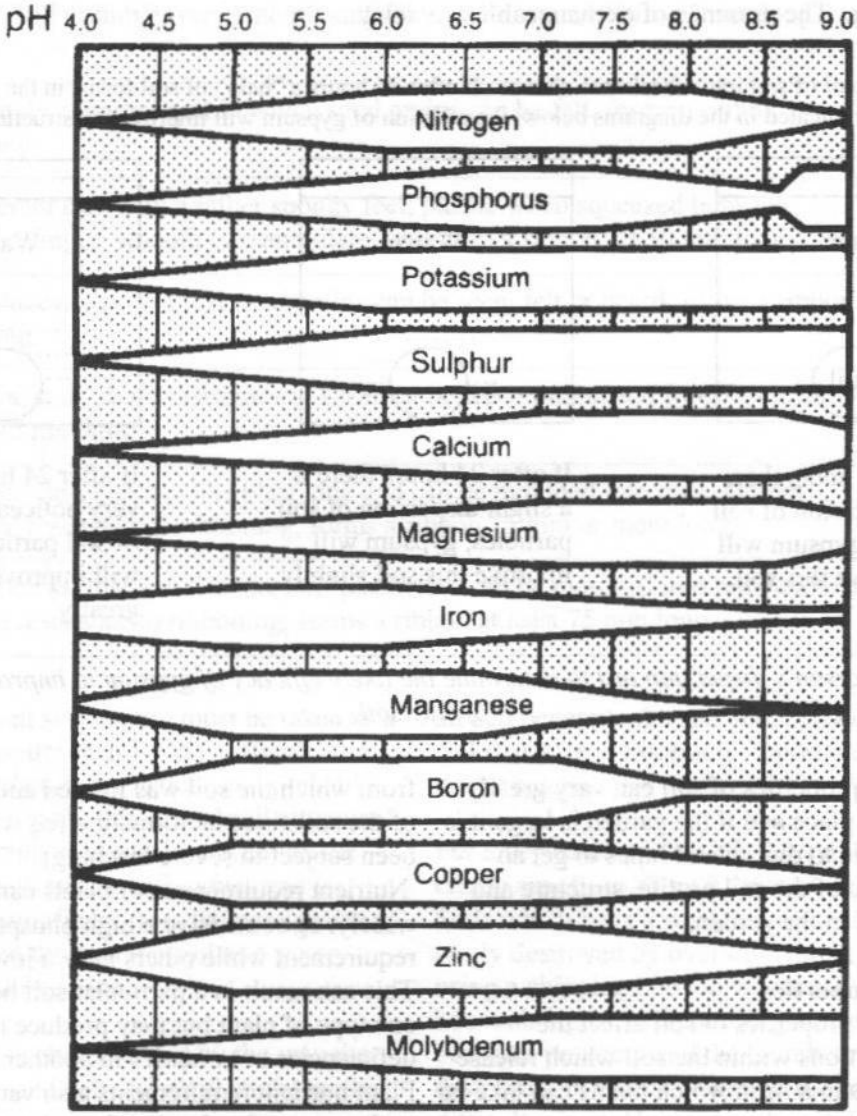


Figure 5: The variation with pH of availability to plants of nutrient elements within mineral soils (not potting mix). The wider the bar, the greater the availability. From Handreck and Black p 91.

Most nutrients are readily available in a pH range between 6 and 7 and this suits most vegetables, although some ornamental plants such as daphne, azaleas, camellias prefer a pH range between 4.5 and 6 while some other plants such as artichokes and abelias prefer a pH range between 6.5 to 9. Few plants can survive if the pH is less than 4.5 or greater 9.5. At the extreme ranges of pH plant roots are damaged.

If nutrient deficiencies or toxicities are noted in plants the first step is to measure the pH rather than supplying fertiliser to correct the nutrient deficiency. The nutrient deficiency may be easily corrected by adding lime or dolomite to the soil if it is too acidic or sulphur if it is too alkaline to bring the pH into the 6 to 7 range. This will release the nutrients already present in the soil. If the nutrient deficiency or toxicity persists it may be possible to identify which nutrients are the problem by the symptoms exhibited by the plant and through better soil management those deficiencies or toxicities may be overcome.

Plant Nutrient Needs

There are sixteen elements known to be essential for the successful growth of all plants. Of these, only carbon (from the carbon dioxide in the air) and oxygen are absorbed by plants directly from the atmosphere; hydrogen and some oxygen come from the soil water absorbed through plant roots. All the other nutrients are absorbed through the roots as ions dissolved in the soil water. While some nutrients can be absorbed by the plant through the leaves (foliar fertilising), it is the soil which provides the vast majority of plant nutrient needs.

The amount of a particular essential nutrient element required by a plant varies according to the particular plant, the element and the particular stage of the plant's life cycle. Those nutrients which are required in the greatest quantities are referred to as the major or macro nutrients. They are carbon, oxygen, hydrogen, nitrogen, phosphorus, potassium, sulphur and calcium. Those nutrients needed in much smaller quantities are referred to as the minor, micro or trace elements. They are magnesium, iron, copper, zinc, manganese, molybdenum, boron and chlorine. Some plants also require traces of elements such as aluminium, sodium, silicon, cobalt, nickel and vanadium. While the above elements play an essential role in plants' biochemical processes, plants also take up many other elements, such as selenium, iodine, fluorine, bromine and arsenic which, though they do not seem to play a role in the biochemical processes of plants, are essential to animals. Consequently, plants may be perfectly healthy but may not provide all the nutrient needs of those who eat them if those nutrients required by animals are not present in the soil.

***Part 2** of Keith's article dealing with the identification of nutrient deficiencies and toxicities and the biological properties of soil will be published in the Summer 2005 edition of Canberra Organic due out in late November. Ed.*

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Keith Colls

As many readers will already know, Keith Colls is a former President of COGS who has made a significant contribution to the establishment of COGS' newer community gardens. He continues to conduct the COGS beginners gardening courses in conjunction with CIT Solutions (see page 5). We are fortunate to be able to complement Keith's excellent article with that of Sandra Norman from Hunter Organic Growers Society—see The Soil Food Web on page 22 of this issue. Ed.

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Terminator shows the way in Charnwood

John and the Eureka Couch Terminator, at Charnwood community garden

We've all faced the challenge of weeding couch and dreamed of an answer.

Well Charnwood member, John Bruyn, who joined the garden about six months ago, has built his dream machine. So COGS—meet the "Eureka Couch Terminator"!

Recycled angle iron, bedsprings and bicycle wheels have all been brought together in an ingenious design that quickly allows the couch – and any other intruders like rocks, glass, bottle tops etc to be separated from the garden soil.

John, a retired geologist who knows his rocks and soils better than most, was inspired by the mammoth machines that Corkhill uses to process mulch at Parkwood. He also spent several months digging and sieving by hand about 30 square metres of garden bed.

"That was very slow," he admits, "And it got me thinking about a better way."

The better way turned out to be the Terminator, pictured. Defying the sceptics amongst the garden members (shame on us!); powered by hand rotation, it easily and quickly separates rocks, gravel, couch, glass and rubbish leaving a wonderful soft loam that just begs to be planted.

In just a few days, John has turned a marginal garden plot into an excellent growing space.

"My machine is 10-15 times faster than using an old bed spring mattress," he says proudly as he shovels his plot into the front of the 'Terminator'. "I will also be able to use it to harvest potatoes."

John is waiting for his call from "The Inventors". Who knows? He may just get it.

Story and Photo—**Stephen Dangaard**

COGS Backyard - Xeriscape Gardens

The Xeriscape gardens open to the public again from the weekend of 3rd and 4th September so it is important that we have COGS Backyard in top condition by then. **Please try and join the next COGS Backyard working bees to be held on Saturday 27 August, 2-4pm and Sunday 9 October, 2-4pm , or help on the COGS stall on 12 November.** Enter through the gate on Unwin Place, Weston (just past the Police complex and opposite Orana School).

Actew Corp *irrigation workshops* will be held at Xeriscape 14 Sept, 5 & 20 Oct, 1&12 Nov, and 1 Dec. They cover installing and using drip irrigation and its benefits; mulching; and drought tolerant plants. Entry is by gold coin donation but you need to phone 6248 3131 to book a place.

Thank you to the following COGS members who have helped at COGS Backyard in recent months:

Peter Cornhill, Adrienne Fazekas, Janet Popovic, Malcolm Sherrin, Judy Tier, Garry Thomas.

News item from the Internet—GM Food Study Raises Human Health Concerns

"Confidential internal research carried out by Monsanto has raised concerns that eating genetically modified (GM) corn may harm human health, reveals The Independent. The research shows rats fed a heavy diet of GM corn developed smaller kidneys and changes in the composition of their blood. The same changes were not observed in a control group of rats fed non-GM food. The disclosures come as the European Union prepares to vote on whether to allow the sale of MON 863, a product that is genetically modified to protect against corn rootworm. Monsanto has dismissed the furor over the study results, according to Reuters, claiming the differences are inconsequential. Scientists and British ministers, however, are calling for further studies. MON 863 has been grown commercially in the United States since 2003." *Source: URL: http://news.independent.co.uk/world/science_technology/>story.jsp?story=640430*

Let's build a greenhouse! and Let's recycle

With 'Bodgy Gardener ' Graham

Mature capsicums covered in early Winter; these with tomatoes got an early start under full cover.

View from the inside—some wilted leaves from an early frost before the covers were put on.

Be it gloating over pre-Christmas tomatoes or crunching into plucked-this-morning red capsicums well into winter that takes your fancy, there's no better way to extend the growing season than with a 'bodged-up' greenhouse. The frost gods quake in their Uggies as their 'last-frost' stand-over tactics become a thing of the past. Tomatoes, capsicums and most other similar longer-season vegies can be started in such a greenhouse in late-winter, as soon as the worst frosts have passed, and be picked without frost-damage (terrible for capsicums) into the next winter. However, it must be understood that not much grows or survives in the chill of mid-winter when daylight hours are at their shortest.

You need to do some research before planting—for example you need to know that eggplants and some other warm-climate vegies will stunt if planted into a cold soil. You can overcome this problem by laying down thick, rich, partially composted mulch—or even a drum compost bin in your greenhouse—to help warm things up as the decomposition provides at least meagre heat. It also seals plastic glasshouse edges nicely. A sheet of black plastic left over the mulch for a few weeks prior to planting works miracles. I've read in one book about using clean odorless burners or lanterns, to provide both heat and carbon dioxide (and maybe even a flaming greenhouse), but this sounds too bodgy even for me.

Once the weather warms up the 'bodgy greenhouse' will cook like a microwave bag, so either roll and open the ends up making a nice paraglider shape (take note) if frost still looms, or take it off entirely. The frame can be left for covering with plastic again at the end of the season and can be additionally 'bodged' to make plant supports.

The beauty of this design is that you can 'plonk' and 'unplonk' it anywhere even when plants are inside; it's cheap as greenhouses go; you can stoop easily inside; and it's simple to set up.

For a house 3-5m long, you'll need to beg, borrow or liberate:

- 3 x thin gauge (15-30ml or so) PVC pipes (anything that will bend but not kink) about 3m long. Electrical conduit is perfect.
- 6 x metal pegs or stout stakes that can slide inside your pipes about 60-80cm long (depending on how hard your ground is).
- A sheet of plastic about 4m longer than your greenhouse and at least 60cm wider than your pipes are long. Bunnings' version is 4m wide (2m doubled over) – perfect for standard 3m long pipe.
- Some weights—river stones, logs or anything *sans* sharp edges.
- Rope in windy areas. Wind tunnel tests suggest using more pipes can be a good idea in really blustery spots.

So let's 'bodge' one up:

1. Hammer pegs in so half of each sticks out.
2. Bend your pipe and slide over the pegs.
3 For windy areas, you can put some guy-ropes on your end tubes.
4. Put the plastic over the half tunnel you just created and pull taut.

Put weights around the edges, leaving the downwind end shabbily weighted for access.

See the construction diagram opposite on page 19.

… Let's recycle—

Be it stinginess, the quest for innovation or simply having too much junk around the place, recycling old items is a prime way to create functional bits and pieces for your garden. It is also very much in the ethos of any organic gardener to recycle as much as possible. Best of all, most of the items listed below are available free or for next to nothing if you ask nicely and smile lots. Here are just a few uses of common goods in the garden—

Pallets as compost bins

Take four pallets and arrange in a square, lash the corners and you have a great compost bin. The slatted sides of the pallets allow air flow but not too much; the resulting size is perfect for good hot decomposition to kill pesky seeds; and if you can find hardwood pallets they last for ages. A plastic cover and/or rough lining is a good idea to keep the moisture in.

Pallets are generally available free so long as you ask nicely, although you'll also see many hobo-pallets abandoned on building sites and in industrial areas needing a good home. As they're free, why not go large and create multi-bay setups—at the Mitchell garden we use 10 pallets to make three connected heaps, allowing easy shovelling and mixing between the heaps.

Drums as water tanks

Clean drums—the ones I've used are from grain—can be sourced from rural supply and second hand joints, creating great cost-effective mini-water tanks. Don't use any that have been used for fuel or chemicals. I have 18 x 44-gallon drums feeding my home garden.

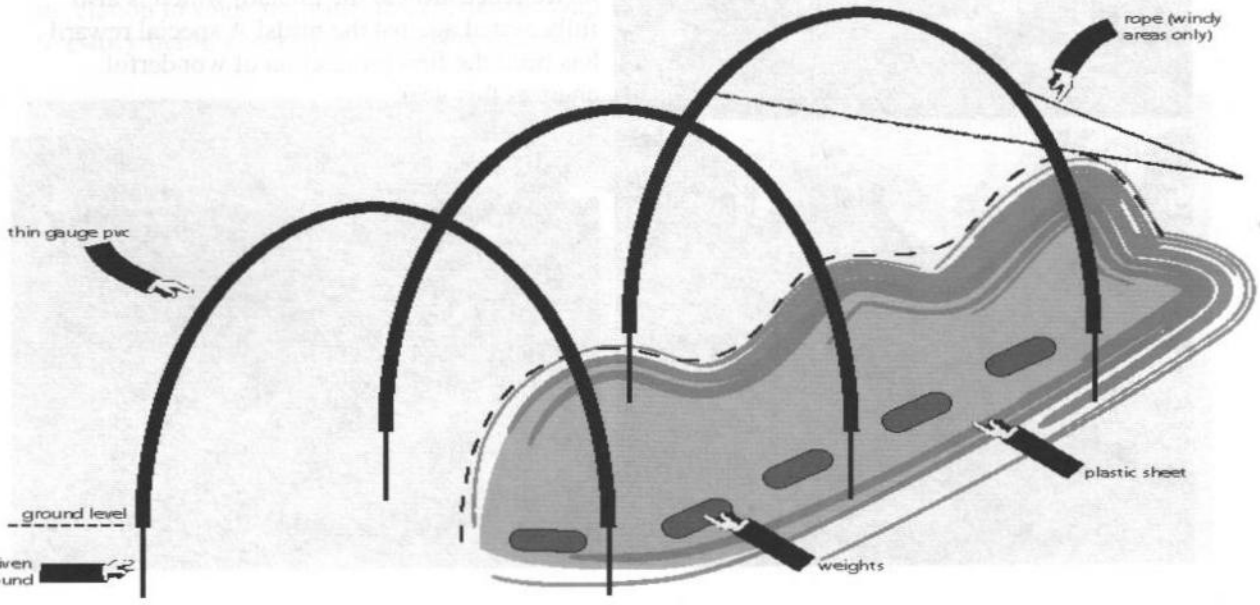
To fill the drums with water, place them under downpipes or diverted gutter-flow (shed run off often not connected to a main tank is a great candidate) or use them as extra storage for those that have tanks. To get the garden drum drinking, drill holes near the bottom of raised drums and attach a tap; use gravity and suck-siphoning—or for those wanting alternative gym membership, try bucket watering.

A pallet compost bin ready to be filled, alongside water storage drums elevated for filling from the main tank—water to then be siphoned out.

A 2-bay bin; left bay has rough lining and cover.

Projects and photos by—

Graham Walker



John and Margaret's "Sea Change"

Many COGS members will remember John and Margaret Allen who for a number of years were active on the COGS committee, including producing this magazine, and in our community gardens. Five years ago John and Margaret made their great escape to a 5 acre property on the south coast where in their retirement they could apply the skills they had acquired successfully growing fruit and vegetables organically in metropolitan Canberra. We invited John and Margaret to come and tell us about their experiences at a COGS general meeting earlier this year and this article is based on their very enjoyable presentation.

Margaret and John had looked for a small acreage in the Canberra environs without finding the right one, but it was love at first sight for both of them when they found the place they have settled in on the coast, two kilometres from the ocean with views to the mountains. They had some soil tests carried out—shale, clay, some good topsoil in parts, a bit low in potassium—and some permaculture advice as the land is not flat. They have installed large water tanks and two dams and have survived the drought quite well. They have a worm farm and do their own composting—the mulching and liquid manure feed being particularly important in the 12 months without any rain. Ongoing organic strategies include growing green manure, using weed tea and manure from ducks, chooks and sheep *in situ*, and allowing the ducks and chooks to forage, under supervision, in the gardens and orchard. They have also tiered the gardens and planted trees along land contours.

John and Margaret brought trailer loads of plants and cuttings from Canberra but soon discovered that what grows well in Canberra doesn't necessarily do well on the coast—the seasons are very different, as are the pests and diseases. On the other hand, they don't get frosts at all, so there is a much longer growing season, for example for tomatoes, and they are growing avocadoes in a protected place near the house and are now trying to grow mangoes.

About those pests—without fencing around the gardens, the 40 fruit trees they planted were given an early pruning by the cows from next door! The neighbour replaced some of these but then the horses from the other side came in as well. The trees have mainly survived but some are rather odd shapes as a result of the unexpected prunings. Next, with the drought, came hungry wallabies....Now there is a three metre fence around the orchard which is also fully netted against the birds! A special reward has been the first production of wonderful cherries this year.

Photos: Page 20—the house, netted vegetable garden and fenced and netted orchard. Page 21—Left: Margaret with Sooty, Right: John with Goldie, Below: Wiltshire horn sheep and the worm farm.

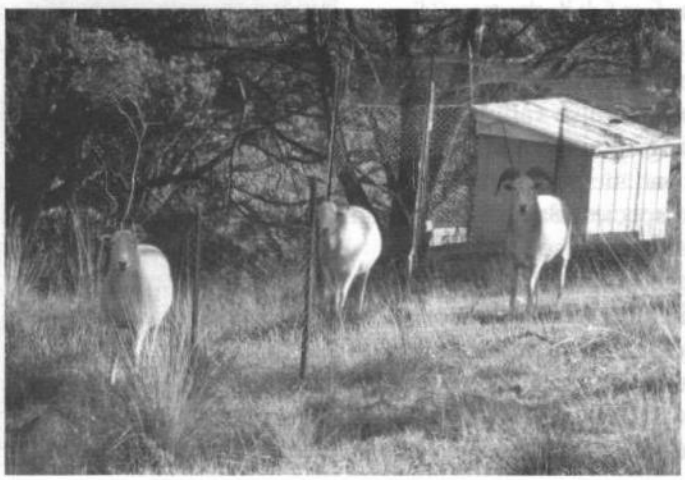
Photos supplied by John and Margaret Allen.

John and Margaret are enjoying the 'fruits of their labour' from the berry garden—they've picked buckets of blueberries, strawberries and youngberries. The berry garden is a 'no dig' garden, heavily mulched, including mulched pathways. They grow their own herbs and vegetables but the vegetable gardens are still not producing as much as John and Margaret were used to harvesting in Canberra. They put this down partly to the need to adjust to climate differences from Canberra. And they have had other diversions—the first 18 months after their move being virtually dedicated to the community action that successfully overturned the unannounced plans of a multinational company with State government support to establish a charcoal plant on the coast. John was treasurer and communications officer for the protest action which with great community mobilisation, fundraising and good solicitors proved it's worth standing up to protect the environment. At one stage some 4,000 people marched in Bateman's Bay as part of the protest.

In their talk to COGS recently John and Margaret said another steep learning curve was in relation to some unfortunate experiences with livestock being attacked by foxes. For example, two dozen chooks were reduced to two in number thanks to foxes, and one night the Allens were awoken to find a baby fox cub having a lesson from its mother on how to get duck dinner, despite protective enclosures. On the other hand, success stories with farm animals include their Wiltshire Horn sheep—great 'lawnmowers' that do not require shearing as they moult their wool. And you will of course have noted the lovely duck Goldie pictured with John on the front cover of this magazine and above. John was present when Goldie emerged from the incubator and as far as she is concerned, John is 'mum'. It doesn't look as if John minds too much and Margaret seems to have a way with young ones also.

John and Margaret would encourage others hankering for a few acres and sustainable living to be optimistic about starting over in retirement. They are delighted with their move to the coast, and enjoying a happy and healthy lifestyle. We wish them well from COGS and thank them not only for their warmly received presentation at the COGS meeting this year but for their consistent and significant contributions to COGS over many years.

Janet Popovic



The Soil Food Web

Soil organisms need food, oxygen, water and suitable habitat conditions. Provide these and you will have an abundance of soil life and a balanced, healthy and fertile soil.

by Sandra Norman[1]

Many of the articles throughout this series on the soil have placed a lot of emphasis on the soil life. Soil organisms and the role they play in the soil are absolutely critical and without these organisms, the soil will be in a very poor state. The health and fertility of the soil is dependent on the soil life. These organisms have many and varied roles in the soil, including:

- Fragmenting organic residues
- Decomposing organic matter
- Cycling nutrients
- Mineralising nutrients
- Storing nutrients
- Improving nutrient availability
- Assisting in the formation of soil aggregates and pore spaces
- Improving soil structure
- Stabilising the soil
- Some have symbiotic relationships with plant roots
- Some regulate the populations of other soil organisms
- Whilst some transmit diseases, others prevent disease
- Some assist in breaking down pollutants
- Some fix nitrogen from the atmosphere.

All soil organisms have a function and what we as gardeners and/or farmers are aiming for is diversity in both species and numbers.

The term "Soil Food Web" is increasingly appearing in the vocabulary in relation to the soil. The awareness of how important the soil organisms are for the health of the plants is being recognised. A lot of research work is being done by a number of individuals and organisations and there is the Soil Foodweb Institute in Lismore NSW that is a laboratory specifically for measuring the life in your soil. As the interest and practice of sustainable agriculture develops, then more information of this complex ecosystem will become understood and available.

So what is the Soil Food Web? The following has been extracted from the *Soil Biology Primer*, written by Dr. Elaine Ingham *et al*, a book published by the Soil & Water Conservation Society, USA, which gives a good description of this complex system that exists in our soils:

"The soil food web is the community of organisms living all or part of their lives in the soil. An incredible diversity of organisms make up the soil food web. These organisms range in size from the tiniest one-celled bacteria, algae, fungi and protozoa, to the more complex nematodes and micro-arthropods, to the visible earthworms, insects, small vertebrates, and plants. As these organisms eat, grow, and move through the soil, they make it possible to have clean water, clean air, healthy plants and moderated waterflow."

This soil food web varies from one location to another, i.e. the soil food web in your particular patch of garden is unique. It is influenced by the type of soil, the type of vegetation and how the soil is managed. The complexity of the soil food web also varies depending upon the number of species and the number of different kinds of species. Bacteria and fungi are the dominant soil organism species accounting for approximately 80-90% of soil biological activity. Some soil will be more bacteria dominated, whilst others will be more fungi dominated. For example, the soil food web in a forest will be very different from that of a cultivated vegetable garden—the forest will have greater numbers of fungi whilst the vegetable garden will be more bacteria dominated. Fungi prefer more acid conditions whilst bacteria prefer a higher pH.

It should be remembered that the majority of the soil organism activity is in the top 10-15cms of the soil. Cultivating the soil kills many of the soil organisms—this is why cultivation practices are so important. (Refer to the article *Soil & Cultivation* in the Summer 2004 edition of the *Hunter Organics* magazine). We need to always be mindful of the soil life whenever we work with our soil.

Some of the soil organisms and their functions include:

Bacteria—decompose organic matter; food for other soil organisms; cycle nutrients; suppress disease; assist in aggregate formation thereby improving soil structure; fix nitrogen and are important for the nitrogen cycle in the soil.

Fungi—break down organic matter, particularly woody material; form symbiotic relationships with the roots of some types of plants—this

A Few Hints about Soil Geology

Different types of rock give rise to different kinds of soil.
SANDSTONE gives rise to sandy soil that doesn't hold nutrients or water.
SHALE gives rise to clays, which sometimes hold nutrients and water too well!
BASALT gives rise to some of the best soils you've ever worked with in your life.

relationship increases the surface area in the roots zone for the uptake of nutrients; improves soil structure by physically binding soil particles into aggregates; food for other soil organisms; reduce leaching of nutrients from the root zone of plants.

Actinomycetes—break down organic matter; whilst some are pathogens, others are predators of disease-causing fungi.

Protozoa—stimulate bacterial activity—this increases the rate of decomposition; mineralise and release nutrients; release nitrogen for use by other soil organisms and plants; predators of some soil organisms particularly bacteria; food source for other soil organisms; suppress disease.

Nematodes—some are predators of other nematodes, bacteria, algae, fungi and earthworms. Others are parasites of plant roots; mineralise and release nutrients; food source for other soil organisms; assist with the distribution of bacteria and fungi through the soil.

Arthropods—includes springtails, beetles, ants, spiders, mites, centipedes, millipedes, scorpions and termites. These shred large pieces of organic matter—increasing the surface area which in turn stimulates bacteria, speeding up decomposition; mix the soil; create 'tunnels' as they burrow, improving soil structure; are predators of other soil organisms, keeping populations under control; stimulate the growth of fungi.

Earthworms—break down organic matter and minerals; mix the soil by taking organic matter further down the soil profile and bringing soil from deeper in the soil profile to the surface; improve soil structure in a number of ways; aerate the soil; improve water infiltration and retention; improve drainage of the soil; bind soil particles into aggregates. Also worm casts (excrement) are a form of soil aggregate.

Algae—increase soil organic matter levels; fix atmospheric nitrogen—require sunlight and moisture—are generally near the surface.

These organisms interact with each other, with plants and with the soil. Some soil organisms can manufacture their own food from inorganic material whilst others must consume other organisms for their food supply. The food web is the transfer of energy from one organism or group of organisms to another. The more complex the food web, i.e. the greater the number of species together with the number of different kinds of species, the healthier the soil and consequently the plants will be.

Our aim always when working with the soil is to encourage this diversity of the soil life. Our inputs into the soil can change the balance of the soil organisms. Green foods such as green grass clippings, green manure crops, etc feed the bacteria whilst brown plant materials such as woody materials, straw etc feed fungi. This is why when you make compost, it is important to be aware of the carbon : nitrogen ratio—the end product will reflect the ingredients that went into the making of the compost heap, which has an effect on the soil organisms when you apply the compost to the soil.

Be aware of the soil life when cultivating as inappropriate cultivating practices can destroy many of the soil organisms and change the physical and chemical characteristics of the soil.

It is very encouraging that research work is being carried out on the role of the soil organisms: how the health of the soil is dependent on a wide range of soil organism species, and how the productivity of the land and disease control is influenced by this soil life.

It can be seen then that the soil needs diversity in both numbers and species of soil organisms. As with all soil processes, all the soil organisms are dependent upon each other and with a good balance, the soil will be healthy and disease free and then so will the plants. "Soil organisms do not exist as individual plants and animals but are an integral part of a greater organism, depending on one another" (Sattler & Wistinghausen).

The soil organisms need food, oxygen, water and suitable habitat conditions. Provide these and you will have an abundance of soil life and a balanced, healthy and fertile soil. The following quote from Ehrenfried Pfeiffer should always be remembered whenever you do anything that will affect the soil: "The soil is a living biological system and has to be maintained."

References

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Bio-dynamic Gardening and Farming, Volume 2, E Pfeiffer (Mercury Press, 1983)

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[1]This article *The Soil Food Web* by Sandra Norman was published in the winter 2005 edition of *Hunter Organics*, the quarterly magazine of the Hunter Organic Growers Society Inc. and is reproduced in *Canberra Organic* with the kind permission of the author Sandra Norman and the Hunter Organic Growers Society. *Ed*

The Chance of a Lifetime

This year we all have a chance to go to an IFOAM Conference right here in Australia. You might not think this is anything very wonderful, so I thought I'd say a little about the ones I've been to.

The first one I went to was held in New Zealand. It seemed like a golden opportunity, so close, so safe … not that I anticipated trouble, it was just that the previous one had been in Burkina Faso where they had just had their third military coup in a few years. I booked for the tour which took us from a hotel in Auckland, all down the North Island and through the South Island to Christchurch, where I was booked into affordable university accommodation. I took videos and photos of everything. We visited laboratories, farms and even a place where they were growing forests watered with sewage, treated first by sedimentation in a large artificial lake. We visited an apple orchard completely enclosed in netting against codling moth and apple moth, and another orchard where they were using traps with synthetic female codling moth hormone to attract the male moths. We also visited a kiwi fruit orchard and learnt the secrets of growing those.

While we were watching the making of grass skirts at the Maori Cultural Centre I put down my bright red nylon bag to take some video of the fascinating process, and left it there. This contained my still camera and my wallet containing all my cash and several credit cards. Luckily I discovered it was missing and ran back. It was still in the same place. I said a little prayer of thanksgiving, and ran to catch up to the rest of the group before they boarded the bus.

There was a greenhouse where they grew cucumbers and used many different insect predators to combat the bad insects. They bought the eggs of the predators and hatched them in the greenhouse. We were able to get the address of the people who were breeding these predators. Of course, we cannot import these things into Australia, but by writing to the firm, you can often get the name of someone doing the same work in your own country.

During the pre-conference bus trips you make friends with people from many different countries. I usually share a room for economic reasons, and have had room-mates from UK, Finland, Dominican Republic and others. As I am used to using youth hostels for my accommodation on all my travels, I find it interesting to try to communicate with people from different countries, and believe me, there are many many countries practising organic agriculture, over 700.

IFOAM is important because it brings together leaders in organics from all parts of the world, and at the General Assembly, which is part of each Conference, world standards are set to be followed by all certifiers who are accredited to IFOAM. NASAA Standards were originally set up from the UK Soil Association Standards which I brought back from England, when NASAA was being set up.

But to get back to the IFOAM Conferences. The second one I went to was in Denmark. From the organic point of view this was very good, because the Danish government is supporting organics in a big way. Because of this, the supermarkets are also supporting it, and the government is funding teaching it. Denmark is a lovely country and very progressive.

There was a special tour in Copenhagen of three community gardens, and a commune which governs itself and although most members smoke marihuana, they do not allow drug dealers to operate within their area. "How do you stop them?", someone asked our tour guide. His reply was that a volunteer group goes to the dealer and tells him to get out. If he won't go, they strip him and take him to the border and send him packing without clothes. This seems to be a very effective deterrent.

The next Conference was in Switzerland and I hadn't seen Switzerland since 1972 on my world trip so I felt I must go there. Basel is in the German speaking part of the country, beautiful agricultural land, although rather hilly. I missed the tour I booked for, as they had not sent the details before I left Australia, and as many others missed it for the same reason, they put an extra bus on for the marketing tour and I was offered a place on that. I was helped with this by a lovely Japanese lady who walked me around Basel on the day that was free. She had brought to the Conference two solar stoves, one of which she set up during the Conference and boiled water to make a cup of tea. She demonstrated this during the whole Conference and took my address

among quite a few and later sent me one. She explained how you could cook a whole meal in black containers in these stoves. This is how I discovered the art of doing sun-dried tomatoes in my greenhouse—no electricity.

While in Switzerland we had a little extra trip to visit the Goetheneum, the building set up as a memorial to Rudolph Steiner, which houses all his books and papers. I can picture this vividly, but may be wrong about the meaning and use of this building, as there was a lot of uphill walking and I never seemed to catch up to the guide in time to hear what he was saying!

The last Conference I went to was in 2002 in Victoria, BC, Canada. It is hard to describe to you the wonderful feeling it gave me to visit the organic and biodynamic farms around Victoria. The owners were there to greet us and tell us how they ran the farm. At one farm, the Jersey cows were in a field. We had just visited the small orchard, where we had been given apples to taste. I had put mine into my red nylon camera bag to eat later. We walked into the field to talk to the cows. They were ever so friendly, especially towards me, and everyone was stroking the cows but the cows were turning away from them and coming to me. Even the owners were saying, "They just love you. You must have a way with cows!" I thought, yes, I was brought up with cows, and then the closest one nudged my camera bag, and suddenly I understood. I didn't tell the others. This was only one of the many small incidents which made up a delightful and interesting tour.

It is the tours that are such an attraction at these conferences, but the conferences also provide a venue for people like the man from Malawi to show what they are doing in their country, and they also give us all a chance to hear talks and see pictures of life in other countries.

For me this year it is a chance to see Adelaide, where I have never been in all the 47 years I have lived in Australia. We got as far as Mt Gambier on one of our camping trips, but never to Adelaide.

This Conference has 15 tours. They are designed to show Australia to the world— because we are so far away, for most people coming from other countries this is their one opportunity to see Australia. At the same time they are also designed to show what we are doing in organics in this country. People from poor countries are offered financial help to come to these Conferences.

For me, it is a privilege to be able to meet those people and talk with them about what they are doing in their country. It is also my privilege to meet people like Jan Denham and Rod May who are working hard with IFOAM to further the spread of organic growing, and to keep it under control by helping to set up organic standards for the world. This is important work for the survival of the whole planet.

Betty Cornhill

15th IFOAM Organic World Congress 20-23 September 2005 Adelaide Convention Centre

This is the first IFOAM Organic World Congress to be held in Australia. It will bring together "leading organic farming practitioners, policy makers, scientists and innovators to ask and answer the big questions about sustainability and investigate long-term strategies for the future .....more than 300 presentations and workshops will critically examine the role, limits and integrity of organic agriculture."[1]

The *Organic World Exhibition* run in parallel with the main Congress program will enable Australian producers, processors and allied service providers to showcase their products and knowledge to the international organic community.

The *Go Organic Festival* will be held the weekend following the Congress, 24-25 September. This will include farmers' markets, food stalls and the best in products and technologies for sustainable living.

For further information:
Telephone: 08 8352 7099
Fax: 08 8352 7088
e-mail: ifoam2005@nasaa.com.au
www.ifoam2005.info

[1] *NASAA Certified Organic, July 2005*

Caption Competition

Graham Walker from Mitchell community garden has supplied us with this wonderful photo for our first caption competition. What would your caption be? To start you thinking Graham has suggested *"For sale—automated fertiliser spreader. Great for citrus."*

Send us your entry marked Caption Competition, by email to editor@cogs.asn.au OR by post to the Editor, COGS, PO Box 347, Dickson ACT 2602 OR drop it in the box at the Membership Secretary's table at a COGS general meeting, by 27 September 2005.

The best entry in the opinion of the editor plus two committee members will win the grand prize of a packet of COGS seeds!

The winner and winning caption will be notified on the COGS website and in the next magazine.

More caption competitions if you tell us you want them.....

continued from page 9 ... Queanbeyan railyard community garden

Where to from here?

There is still some space within the confines of the garden for additional plots and communal beds, and these will be added as time and materials permit. There is currently a lot of interest from the surrounding community about joining the garden, largely due to our prominent position next to a major bike path.

Other projects that are currently on the drawing board are the installation of a system to catch rainwater from the roof of the shed, and maybe even a small pond. The plantings of native trees and shrubs along the outside of the fence may also be enhanced once the current drought breaks.

As with any community garden, nothing would work without the goodwill and enthusiasm of our members, many of whom have been very generous with their time and skills to keep the garden running efficiently. The fact that so many of our members are expert gardeners means that new members can always find someone to turn to for advice (I can now actually grow carrots—thanks Julian and Bosa). We would also like to thank the Queanbeyan City Council for its continuing support for the garden. Thanks also to our long-suffering conveners, Maree and Julie for their help and support over the past year.

A special thanks goes out to the staff at the Minerals Council of Australia, who have taken the time to separate out their compostable rubbish into the bins provided in their office, and are now providing around 5-7 kilograms of kitchen scraps to the garden per week.

Cormac Farrell

Photos on pages 8, 9 by J Popovic.

Orchard carers needed at Cotter community garden!

The Cotter community garden at Curtin includes an old orchard badly in need of some tender loving care. Ann Smith of Cotter garden would love to hear from COGS members who are interested in helping her to revitalise the orchard. Owen Pidgeon from Loriendale Organic Farm has kindly agreed to give some advice including on what pruning needs to be done and we have a member at the Cook garden who has expressed interest in helping with this restoration project. We really need a team to be able to make inroads on this task, so if you want to be involved, please let a COGS committee member know (see contact details on page 32) as soon as possible.

Friday Morning at Kambah

The best place to be in Canberra on a Friday morning, is in our patch of dirt in the COGS Kambah community garden!

Achievable Outcomes provides skills based training to people who identify with a disability. Our goal is to assist individuals acquire independence in skills that will enable full participation within the community. The client base comprises individuals who have acquired a disability as a result of a stroke or injury related trauma and others who identify with a mild to moderate intellectual disability. *Achievable Outcomes* represents over 20 years of experience within the human services industry in Canberra.

Our program commenced its adventure with the Canberra Organic Growers Society—Kambah during winter 2004. All our participating gardeners demonstrate the highest level of community spirit, and this has guaranteed the success of the Friday morning gardening program.

Participants in the program have been learning the principles of companion and organic gardening. We have steadily rotated crops including silverbeet, zucchini, broccoli, cabbage, lettuce, tomato, radish, corn, cucumber, beetroot and fresh herbs. The potato garden fell victim to vandals who trespassed causing damage to many neighbouring gardens.

During winter we are nurturing bulbs anticipating spring and the beginning of the next growing season. Participants are also devising a scheme to outsmart the cockatoos who have taken delight in creating mischief in our garden.

Annette Crotty, Director, phone 6292 6667

Mary O's Patch at Kambah

Mary Ormay has sent us these photos of her patch at Kambah community garden. She says that her most successful crops over the last two years have been cucumber, lebanese zucchini (pictured below right), green climbing beans and tomatoes. From the picture below left it appears that she has also grown excellent eggplant. Mary uses the "no dig" method and says that this greatly reduces weeds.

Mary believes passionately in enriching the soil organically with compost to grow nutritious plant foods and fruit trees. She is in the process of starting up a business as a backyard consultant. She is a native landscaper, natural historian and ecologist and can be contacted at maryo@cyberone.com.au.

Down to Earth Expo—Sunday 11 September
Lake Tuggeranong College
&
CIT Plant Sale—Xeriscape Open Day 12 Nov
Weston

COGS will have stalls at these events. If you can help on a stall on the day or grow punnets of seedlings for sale for COGS fundraising, please contact a COGS committee member (see page 32 for contacts).

Snippets from the Butterfields in Manhattan

Before we left Canberra, Keith Colls mentioned that there was quite an active Community Garden movement in Manhattan, mainly on the Lower East Side. This became evident on Saturday 21 May when the people organised a Spring Festival parade around about 20 sites in the East Village. It was part street theatre and part political activism to keep the developers away from their sites, which were usually plots of vacant land between existing buildings. Some of the sites seemed to be very well organised and set up with sheds, compost bins etc while others appeared to be more 'guerilla gardening' with little infrastructure. There was little evidence of people planting vegetables, but there were a lot of herbs at some sites and perennial flowers (irises being a popular type) at others. It wasn't really possible to interview people to find out what was going on in the gardens as the noise of the drum squad accompanying the parade cancelled out conversation! Most of those in the parade were in costumes (there seemed to be a storyline—about rescuing Gaia—to some of the business) and this is shown in one of the photographs. However, this being the East Village the people in the parade didn't stand out too much from the usual residents!

The worm vendor's stall pictured left was at a farmers market in Union Square in the heart of Manhattan. Since hardly anyone has a garden (except for the community gardens, mainly in the East Village) I guess she sells to people for their pot plants.

The garden pictured far left is on Roosevelt Island which is in the middle of the East River, roughly from the UN up to the middle of Central Park. It is an interesting place, set up like a Canberra suburb to house a wide range of people. As with the East Village gardens, mostly flowers are grown, although we did see a few vegies here and there. I have lost details of the plot fees but they were roughly four times those charged by COGS.

Martin and Frances Butterfield, New York

More on couch elimination—by solarisation
This involves covering the couch-infested area with clear plastic (new clear polythene or greenhouse plastic). The joining of sheets of plastic is important—line up two straight edges, roll them over together twice, then fasten them at intervals with bulldog clips. This wind- and waterproofs and is tight enough to allow for solarisation.

In November-December, when air temperatures rise (30°C is ideal), water the affected soil, cover with slashed down green manure if available, and cover with the plastic prepared as above. The soil should be mounded under the plastic to encourage runoff of water and the edges of the plastic buried in soil to secure it. If there is insufficient draining slope on the plastic you will need to mop up after rainfall. After six weeks all the weeds should have been killed off and the soil pasteurised in temperatures similar to a hot compost heap. This process will have also killed off beneficial soil life so before planting it will be necessary to add compost or a commercial RAMS (fungi) preparation so that plant roots will be able to take up minerals from the soil.
Source: Ed. notes from talk by Dr Jonathon Banks, Pialligo Apples, COGS general meeting, 24 May 2005.

Orchard matters—
Rake up fallen leaves from orchard trees and compost these with manures in a hot compost heap. Use the compost on the vegetable garden, not the orchard, as apple scab is carried on leaves.

For protection against codling moth use ferumo ties, three per tree. Check apples in December and remove any fruit showing signs of codling moth damage. Allow chooks to scavenge at the base of trees. For a small number of trees, use grease bands or corrugated cardboard to collect overwintering moths but these need to be collected and burned every 10 days.

Woolly aphid can be countered with methylated spirits and hot soapy water applied with a paint brush or toothbrush.

When pruning fruit trees, aim to open them up—ripening apples need sunlight for colour—and encourage more horizontal branches that bear the fruit.
Source: Ed. notes from talk by Owen Pidgeon, Loriendale Organic Farm, COGS general meeting, 21 June 2005.

Fruit trees and soil fertility—
Fruit trees may produce more fruit on trees grown in highly fertile soil but superbly tasting fruit are sometimes grown on old low growth trees established in infertile (low nitrate) soil. Fruit trees, as opposed to vegetables, appear to cope "on the edge."

Some biodynamic farmers believe that weeds have a key function in permanent orchards and vineyards (some of the more interesting wines coming from 'untidy' vineyards), remembering that orchards are long-term (apple trees may last 100 years and pear trees 400 years).
Source: Ed. notes from talk by Dr Jonathon Banks, Pialligo Apples, COGS general meeting, 24 May 2005.

Organic deterrent mixes—
It is reported that Victorian rose growers have found that a spray of one part full cream milk to nine parts of water, sprayed weekly initially, then fortnightly, has been effective in the control of black spot on roses.

Wetting cabbage leaves, then sprinkling them with a mixture made from half a cup of salt combined with one cup of flour may deter cabbage moths.
Source: Journal of the Henry Doubleday Research Association of Australia Inc, Natural Growing, Winter 2005, pages 9, 10.

Propane Weed Treatment Popular with Organic Farmers—
"Propane is becoming increasingly popular with organic farmers as a weed control strategy, reports WBOC-TV. Burning the weeds off with propane protects air and water quality, and doesn't leave chemical residues on the crop plants. According to the feature, the propane industry has already invested $1.1 million in organic farming in an effort to make propane a key part of organic farming by 2007."
Source: URL: http://www.wboc.com/Global/story.asp?S=2964005&nav=MXEFWVlc
Related ATTRA Publication: Flame Weeding for Agronomic Crops

SPRING VEGETABLE PLANTING GUIDE

Spring is the main planting season in Canberra. The timing of some plantings may need to be varied depending on the particular season. Be prepared to protect your frost tender seedlings, as harsh frosts can occur right through Spring. Make your own cloches from plastic bottles with the bottoms cut out, or use row covers for larger plantings.

When direct planting with small seeds, eg. carrots, bulk out first by mixing the seeds with sand. You can help the plants pre-germinate by keeping them in moist sand for about 4 days before planting out (do not let them actually germinate).

When planting out large seeds, eg. pea or corn, soak overnight in a weak seaweed solution prior to planting; alternatively, keep seeds moist between 2 pieces of kitchen paper for 3 to 4 days until seeds germinate, then plant out carefully. This is particularly useful if you are not sure of the seeds viability.

Check your seed packets for their "use-by" date as poor germination may result from planting after that time, or plants may show a lack of vigour when the seedlings come up.

A seed should be planted at a depth 2 to 3 times its diameter, although it is better to plant too shallow rather than too deep.

CROP ROTATION:

Remember to rotate the crops you grow in a particular garden bed. Crop rotation is a most important practice for organic gardeners. Successive crops should not come from the same plant families nor make the same demands on nutrients i.e. follow heavy feeders with light feeders. Also successive crops should not share the same diseases or attract the same pests - this prevents a build up of disease problems, and reduces losses from pests. There are numerous crop rotation schemes used, but try to keep to at least a 4 year rotation period and do not grow members of the same plant family in the same bed in consecutive years. e.g. the solanum family - tomatoes, capsicums, eggplants and potatoes.

PLANT VARIETIES:

It is important with crops such as cabbage and lettuce to choose the appropriate variety for the time of year. Lettuce varieties best suited to early Spring are Cos, Salad Bowl, Butterhead and Mignonette.

	SEPT	OCT	NOV
Globe Artichoke	T	T	
J'salem Artichoke	T		
Asparagus	S	S	S
French Beans		S	S
Beetroot	S	S	S
Broccoli			S
Brussels Sprouts		S	S
Cabbage	ST	ST	ST
Capsicum*		S	ST
Carrot	S	S	S
Cauliflower			S
Celery	S	ST	ST
Cucumber*	S	S	ST
Eggplant*	S	S	T
Endive			S
Leeks	ST	ST	T
Lettuce	ST	ST	S
Melons*	S	S	ST
Onions	T	T	
Parsnips	S	S	S
Peas	S	S	
Potatoes	S	S	S
Pumpkins*	S	S	ST
Radish	S	S	S
Rhubarb	T	T	
Silverbeet	S	S	ST
Snow Peas	S	S	S
Spinach	ST	ST	
Squash*	S	S	ST
Sweet corn		S	ST
Tomatoes*	S	S	ST
Turnips, white	S		
Zucchini*	S	S	ST

S= seed sowing
T= transplanting seedlings

*** When planting these seeds before November the seed should be started in punnets indoors and the young seedlings kept in a warm sheltered place. Plant out the seedlings once the soil has warmed and the danger of frost has passed.**

Canberra Organic Quick Quiz

1. Why should earthworm activity be encouraged in an organic garden?
2. How can earthworms be attracted to your garden?
3. Name three types of living soil organisms.
4. Where do the majority of soil organisms live?
5. Why is mulch so important in encouraging soil life?

Answers are on page 35. Too easy? Send your own quiz and answers for possible publication to editor@cogs.asn.au

COGS Committee Members & Helpers

President	Adrienne Fazekas	6247 5882	afazekas@yahoo.com.au
Vice President	vacant		
Secretary	Ben Bradey	6161 0329	info@cogs.asn.au
Public Officer	Ben Bradey	6161 0329	info@cogs.asn.au
Treasurer	Michelle West		
Membership Secretary	Jen Johnston	6288 3200	members@cogs.asn.au
Librarian	Beby Bros	6248 0063	
Editor	Janet Popovic	6258 2811	editor@cogs.asn.au
General Committee Members	Stephen Dangaard, Sophia Williams		
Garden Conveners			
Charnwood	Stephen Dangaard	6258 9302	
Cook	Alan Robertson	6251 0906	araba@netspeed.com.au
Cotter	Andy Hrast	6288 7262	andy.hrast@dotars.gov.au
Dickson	Beby Bros	6248 0063	
Erindale	Christine Carter	6231 5862	ccarter@netspeed.com.au
Holder	Jen Johnston	6288 3200	
Kambah	vacant		
Northside	Ben Bradey	6161 0329	bbradeyau@yahoo.com.au
Oaks Estate	Robin Walter		
Queanbeyan	Cormac Farrell	0422441358	cormac.farrell@minerals.org.au
Theodore	Richard Reed	6291 1897	rmjreed@ozemail.com.au
Monthly Meetings			
Seed exchange	Ray Harber		
Book sales	Murray Dadds		
Supper conveners	Marie Bahr, Mary Flowers		
Librarians	Beby Bros, assisted by Victor Oates		
Web manager	Ben Bradey		info@cogs.asn.au
Telephone contact	Elizabeth Palmer	6248 8004	
Inquiries about Organic Growing		6248 8004	info@cogs.asn.au

To contact COGS

Email **info@cogs.asn.au** or visit our website at **www.cogs.asn.au**

COGS monthly meetings are held at **7:30pm** on the **4th Tuesday** of each month (except December and January)
Venue Note: For August 2005 - Room 4 of the Griffin Centre in Civic; September onwards in nearby new building (people will be on hand to direct you on the night) —Visitors Welcome

Canberra Organic Growers Society Inc.

INFORMATION

GENERAL INFORMATION

The Canberra Organic Growers Society is a non-profit organisation started in 1977 with the aim of providing a forum for organic growers to exchange information and encourage the adoption of organic growing methods. COGS is an association without specific political or religious affiliation as a group. COGS has the following objectives – to:

- Foster the use of organic methods in home gardening, horticulture and agriculture
- Foster organic agricultural knowledge
- Promote the production and consumption of certified organically grown foods and the adoption of recognised organic standards
- Demonstrate and encourage the use of organic growing techniques
- Provide a forum for the discussion of matters of interest to organic growers in the ACT and surrounding region
- Facilitate the exchange of information and ideas between members and with other organic growers
- Assist members in establishing their own organic growing areas
- Administer community gardens operated under organic agricultural principles for recreational, educational or rehabilitation purposes and for the self-supply of contaminant free produce.

ADMINISTRATION

COGS is run by a voluntary committee which is elected annually at the AGM in March. The committee meets monthly and all members are encouraged to consider participating in the work of the committee.

MONTHLY MEETINGS

Meetings of members are held in Room 4 at the Griffin Centre, Civic, at 7.30 pm on the fourth Tuesday of the month (except in December and January). Each month there is a guest speaker. Recent meeting topics have included Backyard poultry keeping, Worms, Herbs and Seed Saving. At the meetings there is a produce and seed exchange table and a bookstall. COGS seeds and seedlings are often available for purchase. Members may also borrow two items from the COGS library. A light supper is available after the meeting.

Visitors are welcome.

QUARTERLY MAGAZINE

Canberra Organic, the quarterly publication of COGS, contains articles on organic growing, informs members of upcoming speakers and events, and includes planting and growing information specifically for the Canberra region. Members are encouraged to contribute articles.

COMMUNITY GARDENS

COGS currently operates 11 community gardens in the Canberra region. Gardens are located at Charnwood, Cook, Curtin (Cotter Garden), Dickson, Erindale, Holder, Kambah, Mitchell (Northside Garden), Oaks Estate, Queanbeyan and Theodore. Members may obtain plots to grow organic produce for home consumption. These gardens provide a wonderful opportunity for people to garden with other organic growers, to share their expertise and learn something new at the same time. Plot holders are required to pay an annual levy to cover the cost of water, insurance, tools and maintenance. The ACT Government has supported the establishment of these gardens through the ACT Office of Sport and Recreation and the Department of Urban Services Community Renewal program.

INTERNET

COGS maintains a web site devoted to organic growing at www.cogs.asn.au. The site contains the COGS information papers on organic growing, seasonal planting guides, certification information, a page for children and links to related organisations and information sources.

OTHER ACTIVITIES

From time to time COGS organises other activities for its members. For example, we participate in the World Environment Day fair and arrange information days at "COGS Backyard". Seminars and workshops are also conducted.

CONTACT

COGS
PO Box 347
DICKSON ACT 2602
Phone: (02) 6248 8004
Email:info@cogs.asn.au
Web: www.cogs.asn.au

COGS NOTICE BOARD

Don't forget to check the COGS website at **www.cogs.asn.au** for updates and new notices.

Speakers

7:30 pm, Bunda Street, Civic
(See Venue Note, at foot of page 32)

23 August 2005
Cedric Bryant, Garden designer and ACTEW Water Ambassador—
Drought-proofing your garden

27 September 2005
Graham Walker and Ray Harber—
Seed exchange evening

25 October 2005
Jackie French

22 November 2005 (to be confirmed)
Shirley Cardin
Herbs

Farm Visits

Saturday 5 & Sunday 6 November.
Allsun Garden Farm—opening as part of *Gundaroo open village weekend.* Cost $10 per adult, which allows entrance to Allsun Farm plus 9 other gardens.

COGS Working Bees

COGS Backyard—*see page 17.*
Saturday 27 August, 2-4pm
Sunday 9 October, 2-4pm

Beginner Gardeners Course

The next course commences **6 November 2005**. This course is conducted by former COGS President Keith Colls for COGS in association with CIT Solutions. *For further information see page 5.*

www.cogs.asn.au for updates and confirmations.

Events

11 September 2005
Down to Earth Expo including COGS stall, Lake Tuggeranong College—*see page 28.*

17-18 September 2005
2005 National Daffodil Championships
Lancaster Hall, Wesley Centre, Forrest ACT
17th: 12-5pm, 18th: 11.30am-4pm.

20-23 September 2005
15th IFOAM Congress & Exhibition, Adelaide

24-25 September 2005
Go Organic Festival, Adelaide
—*see pages 24-25.*

29-30 October 2005
Sapphire Coast Producers Association's Field Days, Bega—*see page 16.*

12 November 2005
CIT Plant Sale and Xeriscape Garden Open Day, Weston—*see pages 17 and 28.*

Saturday mornings, 8am-11am
Farmers Market, EPIC
(enter near Shell service station)

COGS Community Gardens Annual Meeting Dates

Charnwood—Saturday 3 September, 3.30pm
Cook—Sunday 18 September, 12 noon
Cotter—Sunday 11 September, 9am
Dickson—tba
Erindale—tba
Holder—tba
Kambah—Saturday 3 September, 10am
Mitchell—Saturday 10 September, 1pm
Oaks Estate—tba
Queanbeyan—Saturday 3 September, 10am
Theodore—Sunday 25 September, 10am

Canberra Organic Quick Quiz Answers

1. Earthworms aerate the soil, improve soil structure and break down organic matter, making nutrients available to plants.
2. With moist soil and a supply of organic matter earthworms will naturally enter your garden.
3. Fungi, bacteria, protozoa, earthworms, insects and arthropods can all be found in a biologically active soil.
4. In the top 10 - 15cms of the soil where adequate oxygen is available.
5. An organic mulch helps to maintain even soil moisture and temperature levels and provides food for soil life.