



Learn Grow and Thrive

with

Cath Manuel

4 Weeks to Fresh Food Lesson 4.

~ Nurturing ~

~ Please print your Lesson Notes and read through prior to each Lesson.

~ Spaces are available through the Lesson Notes to take extra notes during the Lesson.

Enjoy!!

Nurturing...

“Caring for your garden, feeding the soil then harvesting and preparing food for yourself and others is nurturing for the soul. If we care about what comes out of the earth we are feeding our body everything it needs to thrive” Cath Manuel

~ From the Ground Up ~

Our soil contains living organisms and we must nurture and feed them as we would ourselves. We will then have abundant crops of nutrient-rich foods that provide us with the nutrients our bodies need. Feeding the organisms in the soil is as simple as adding organic matter and the organisms then provide food for the plants.

Here's a few ways to help the soil in your gardens...

Increase organic matter, especially nitrogen, as it adds moisture.

- Organic resources – things that are from a natural source, eg plant matter
- Organic products – liquid fertilisers, eg worm juice, compost tea, comfrey tea, purchased products (ensure they are organic) and slow release fertilisers, eg blood and bone, organic manure pellets, etc.

Gather resources from around your home. Don't throw away green waste into green waste bins, keep it all...I don't call it waste!!

~ Plant Nutrients ~

Having the soil enriched with nutrients, organic matter and then mulch added, will give plants the nutrients they need.

Macro are pure elements (needed in large amounts) which include Nitrogen, Potassium, Phosphorus, Calcium, Sulphur and Magnesium. Micro are trace elements (needed in smaller amounts) and these include Zinc, Copper, Iron, Boron, Manganese, Molybdenum.

Plant disorders are the result of too much (toxicity) or too little (deficiency) of nutrients/elements.

Blood and Bone is a great garden product as it contains phosphorus, nitrogen, calcium and magnesium and will provide nutrients, help to break soils, assist to decompose organic matter (great for compost activator) and provide food for organisms.

Regular bone meal doesn't contain potassium (k), so potash should be added to fruiting and flowering crops. **Phosphorus** (p) – for root growth and growth of new shoots, **Nitrogen** (n) – for leaf growth.

TIP – Some blood and bone products have Potash (potassium) added, so check the packaging when purchasing.

**** Bone meal is a mixture of finely and coarsely ground animal bones and slaughter-house waste products. It is used as an organic fertiliser for plants and as a nutritional supplement for animals. As a slow-release fertiliser, bone meal is primarily used as a source of phosphorus. Finely ground bone meal may provide a quicker release of nutrients than the coarser ground version of bone meal. (Wikipedia)**

This is the time to get to know your soil, so take a soil sample to determine the soil type and pH levels, (*a quick and easy way is with a pH test kit*) and apply any products necessary to amend the soil pH.

Simple Method for Soil pH testing

The plant's ability to access nutrients in the soil largely depends on the soil's pH level and each plant has its own pH requirement. pH (per Hydrogen) is the term given to indicate the Hydrogen ion or positive charged Hydrogen atom. The pH scale is measured from 1 to 14 with acid being the lower number and alkaline a higher number.



Knowing your soil's pH level is very important as the level has to be correct for the plants in your garden to access nutrients. Get to know what each plant's pH requirements are then test your soil and make any adjustments **before planting**. pH test kits are available at most hardware stores, garden centres and produce stores.

To adjust acid soils apply lime to soil before planting and to reduce an alkaline soil add sulphur. By adding compost you can generally balance the pH level to neutral without having to add other products. Good compost is about 7 or neutral pH and by adding it before planting an acid or alkaline soil can become closer to neutral.

TIP - When applying additives and products to soil and gardens, *ALWAYS read the application rate suggested by the manufacturers*. Too much of any product added to the soil can damage the Soil Food Web, create toxicity and harm plants.

Keep this in mind when looking at results...

- ❖ acid soils with pH less than 6 can have deficiencies in some minerals
- ❖ alkaline soils with pH higher than 7 could have nutrients unavailable
- ❖ For a balanced healthy garden aim for pH around 5.5 to 6.5 or 7.
- ❖ Use Lime to increase soil pH. Dolomite is ok, it's a mixture of calcium carbonate and magnesium carbonate, and it costs more than lime. Dolomite is only used for magnesium deficiency in soils.
- ❖ To reduce soil pH use powdered sulphur.
- ❖ The best way to bring pH closer to neutral is with organic matter.



~ Improving the Soil ~

I believe in feeding the soil, not the plants. If your soil is well fed and balanced then the plants have the ability to uptake all the nutrients and moisture they need.

If you have existing areas that could be transformed into highly productive veggie gardens or stunning ornamental gardens, then take simple steps to a thriving garden.

TIP – You can also use these methods at the end of a growing season to get your gardens ready for the next season's crops. By adding plenty of organic matter, nutrients, water and mulching will then replace anything that will be lacking in your soil from a previous crop.

Applying soil improvement products is adding food for the micro-organisms in the soil and also helping to create humus.

Gently loosen the soil with a garden fork and apply a deep watering to soil before products are added.

Limit digging soil, especially when soil is in a fragile condition. Use a garden fork to aerate the soil but no deep digging and turning.

Gypsum (Calcium sulphate) can be used to help break up heavy clay soils and doesn't alter pH levels.

An example of organic products are –

- ✪ crushed rock minerals
- ✪ organic slow release pellets
- ✪ blood and bone
- ✪ well rotted manures
- ✪ compost
- ✪ mushroom compost
- ✪ worm castings and juice
- ✪ liquid fertiliser
- ✪ molasses
- ✪ green plant prunings
- ✪ support plants – see list below
- ✪ green and brown lawn clippings
- ✪ hay or cane mulch

You may not need all these ingredients at once, so use the products you have available and what your soil may need. The more organic matter you add the richer and deeper the humus layer will be.

To improve soil in gardens follow this method –

- ✓ Lightly dig into the soil with a garden fork...watch irrigation pipes!
- ✓ Give the soil a deep soak of water in the morning, or late afternoon before applying ingredients. When watering apply deep soaking, rather than often shorter applications.
- ✓ Nutrients – minerals & slow release organic fertilisers **blood 'n bone is great!!
- ✓ Nitrogen – green manure crops, chop & drop, garden clippings or green lawn clippings
- ✓ Compost, mushroom compost, worm castings or rotted manure
- ✓ Water & liquid fertiliser
- ✓ Carbon – mulch layer on top
- ✓ Rest time for 4approx.. 2-4 weeks

Ensure you allow adequate time for these ingredients to blend through your existing soil before planting (4approx.. 4 weeks), as some of these products can be quite strong and could burn the roots of the new plants if not blended well through the soil.

Always apply mulch and water the area well after applying these products and then continue to water during the fallow or resting period.

Notes...

~ Grow Support Plants around your Gardens ~

To have plenty of organic matter to use in soil improvement I recommend growing the following plants throughout your garden areas. These plants provide green foliage to 'chop and drop' around gardens before covering in compost, mushroom compost, manure, blood and bone and mulch.

Used regularly these plants will add vital nutrients to the soil.

Useful plants include Nasturtiums, Comfrey, Pigeon Pea, Arrowroot and Lemongrass. Support Plants are used to improve soil health, as mulch and companion plants. Growing these plants amongst your gardens will provide you with valuable resources available as needed.

To apply: Chop up the foliage or the support plants, place over the soil and all around garden plants, cover with a sprinkle of blood and bone then cover in cane or hay mulch. Give the ingredients a good soaking of water. This is a quick and easy way to feed the soil!



Grown throughout gardens Nasturtiums provide colour, encourage bees for good pollination and can be chopped up and used, throughout

gardens to improve soil.

TIP - Marigold and Calendula are also edible flowers and used in salads and many other dishes. They are also useful companion plants grown throughout veggie gardens and larger growing areas.

Comfrey – *Symphytum officinale*

Comfrey is a clumping, rhizomatous perennial, growing to about 1m high and up to 2m in size. It has coarse, hairy leaves and produces small purple flowers throughout the year. It's a close relative to Borage and bears a similar resemblance during flowering.



I call Comfrey a superfood for the soil as the plant, when established, has a deep tap root which mines its way deep into the sub soil and accesses nutrients that most plants cannot. It then draws up these minerals and stores them in its leaves, which we cut and use in many ways around our garden, for medicinal purposes and also as a food source.

It also has little or no problems with pests or diseases so I guess this is why so many people grow Comfrey and it's recommended to all gardeners.

Arrowroot – *Canna edulis*



Arrowroot is a tall, clumping perennial plant that grows from rhizomes underground will multiply prolifically in deep rich friable soil.

The flowers range in colour from cream, yellow, orange and dark red and are similar looking to a Canna Lily (same family).

It is frost sensitive, and prefers a fertile, moist soil and grown in a warm climate. Use arrowroot in the compost heap to add layers of nitrogen or as a chop and drop to enrich your soil.

Arrowroot is a multipurpose plant. It can be used to create shade and shelter around garden beds, to keep gardens cool and is also very useful in the compost and for mulch.

Arrowroot is also an edible plant. Slice up the rhizome (roots) and soak in water for a few hours to remove the starch. They taste similar to water chestnut. You can also roast them with Rosemary, Garlic, as splash of Olive Oil and salt & pepper, until they are soft and sweet, similar to a yam or sweet potato. My kids enjoy them like potato wedges!!

Lemongrass - *Cymbopogon citratus*

Lemongrass is a tall growing, densely tufted, perennial grass. It is native to India and tropical Asia and widely used as an herb in Asian cuisine. It has a subtle citrus flavor and can be dried and powdered, or used fresh.

Lemongrass can also be used in the garden as a living mulch. By cutting down the grass and laying over garden areas it will help to suppress weeds and will also break down, adding nitrogen to the soil. If you have a fenced area, eg near chooks, lemongrass makes a great hedge, windbreak or living fence line.



~ Fruit trees ~

To grow a good amount of produce from your fruit trees the soil must be well fed. As a general rule (as I have many different tree varieties) I feed my fruit trees each season. E.g. four times per year I apply the following... (this will vary on the size of each tree)

Using a bucket I mix (with gloves on)

- ✓ 5 large handfuls compost or rotted manure, e.g. horse, cow
- ✓ 1 handful blood and bone
- ✓ 1 handful organic fertiliser pellets

Also have ready a large bucket of chopped support plants, e.g. Comfrey or other garden clippings or green lawn clippings and a bucketful of hay or cane mulch (carbon layer)

To apply this

- ✓ remove mulch from around the tree
- ✓ apply a few good size handfuls of chopped green plants
- ✓ apply the manure mix over the leaves, all around the soil at the drip line then in towards the trunk, never closer than 5cm
- ✓ soak with a watering can full of diluted liquid fertiliser or a good deep hosing
- ✓ cover in hay, cane or other mulch.

If there are weeds growing just cover all with a few sheets of wet newspaper and then re-apply mulch.

Always check what each individual trees needs are, especially ornamental or native species, as many will have different nutrient requirements to fruit trees. It's a good idea to get to know all of your trees in the garden.

During the seasons apply a foliar feed (liquid fertiliser) monthly all over foliage and soil, more often if the tree is showing signs of deficiencies.

~ Pest & Disease Management ~

Keeping your garden well maintained is the key to having a productive and gorgeous garden. By keeping up to date on these activities you will find your garden will thrive, you'll enjoy it more and there'll be plenty of produce to harvest.

One of the Permaculture Principals is '**Use and Value Diversity**' or *work with nature, not against it*. This means to provide nature with everything it needs to thrive and grow, with minimal interference. We can easily adopt ways to encourage bio-diversity in our gardens.

You need to constantly **OBSERVE** your plants and the gardens. By getting to know your garden you're able to notice any changes in your plants. Keep in mind seasonal changes (deciduous trees) and also a change in weather conditions (high rainfall or dry periods).

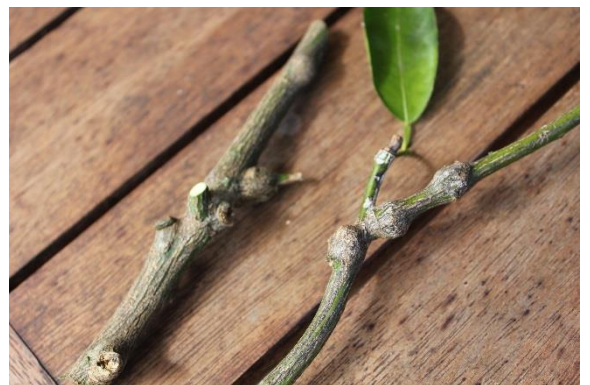
If you are regularly observing your garden then at times throughout the year you may notice different pest problems or possibly diseases on your plants. It's important to know how to identify these to apply solutions.

Here's a list of a few of our common problems...

Insects...

Chewing – caterpillars, grasshoppers, earwigs, weevils, fruit flies, beetles (specific, eg hibiscus beetle) borers

Sucking – aphids, scale, thrips, bronze orange bug (stink bugs), harlequin bug, mealy bug, moths, psyllids (eg, Lilly Pilly Psyllids) **citrus gall wasp (see image)** or leaf miner



Aphids and scale are sucking insects, which means they attach themselves to the plant, either the leaves or stems, and suck the sap from the plant.

Over time this will create many growing problems in the plant including nutrient deficiencies.

The pests have an excretion which turns into **sooty mould (disease)**. I'm sure many of you have noticed lots of small black ants running all over a shrub or tree and the black sooty mould covering the leaves.



Sooty mould develops from the pests excretions which the ants also feed off.

Most sucking insects attach themselves to the new growth on plants as this is a highly concentrated area of sugars in the plant.

Always check your new leaf growth for sucking insects and treat with natural

spray or
remove by spraying with a hose.

Beneficial Insects – not all insects are bad news!! Actually, the majority are good for your garden and considered as beneficial insects. This is where the use of chemicals is damaging as they don't choose which pest to kill, they just kill them all.

Some beneficial insects are praying mantis, most ladybugs (over 26 spots are the damaging ones), hoverflies, lacewings, dragonflies.

Parasitic pests are small parasites that feed on many sucking insects. These are very important helpers, and they're so small we usually can't see them, although they are working hard in our garden!!

Diseases - Fungal, Bacterial and Viral.

Disease pathogens are spread throughout the gardens and soil by humans (shoes, tools, plants or pots), machinery, animals, water and insects. It is important to maintain hygiene at all times when dealing with diseases.

A few examples of diseases are Leaf spot, mildews, sooty mould, black spot, blight, moulds, nematodes and collar rot.

Homemade remedies are useful if you can't deal with pests or diseases using other methods. There are different applications for chewing or sucking insects. Plants that are being eaten by chewing insects can be sprayed with natural deterrents, eg chilli and garlic sprays. Sucking insects are treated with oil based sprays which smother the little suckers, therefore killing them.

Here are a few homemade remedies that I use in the garden...

One of my favourite remedies is a **simple oil based spray**. If any of my trees or shrubs show signs of **scale or mealy bug** I spray them with an oil spray which smothers the sap suckers and suffocates them. (I know, it's not nice!!)

It's easy to make this spray and both products we have in our kitchens. Mix a half cup of **natural dishwashing liquid** with one cup of **vegetable oil**. Shake well and store in a sealed jar or container. To apply blend one part oil mix to twenty parts water in a spray bottle and apply to affected plants in the late afternoon, so the plant does not burn during the heat of the day. I would recommend re-applying again in a week's time to heavily affected plants.

Home Made Garlic Spray for your Garden

- ✓ 5 cloves garlic peeled
- ✓ 1 cup cooking oil
- ✓ 1 teaspoon of dishwashing liquid (use a natural product) or natural liquid soap
- ✓ 4 cups of water

Mash/mince the garlic and soak in vegetable oil overnight.

Strain garlic/oil mix and blend with soap and water.

Spray on plants to deter sucking insects like aphids, mealy bug or scale.

All purpose spray – useful as a pest repellent

- ✓ 1 onion - peeled
- ✓ 3 cloves garlic – peeled
- ✓ 2 chilli

I suggest using gloves when making this brew !!

Place all ingredients in a food processor and blend into fine paste.

Add to 1 cups water and steep overnight. Next day strain out liquid and store in a glass jar. To use dilute 1 part to 3 parts water and place in spray bottle. Apply as needed over foliage, especially after rain.

Milk Spray for Mildews

3 cups milk in 5 litres water and spray over foliage, including under the leaves.

NOTE – these recipes are useful, but only after other solutions have been applied. If your plants are not healthy then these sprays may not be very effective, just a band-aid solution...

TIP - If you provide the right environment then all the good things needed for a beautiful garden will appear. This is called **Bio-diversity** – (*def: the existence of a wide variety of plant and animal species in their natural environments.*)

Create a **poly-culture garden** or follow **inter-cropping** methods, meaning many plant species growing together. Mono-culture gardens/agriculture produces one crop, have one set of soil/nutrient requirements and will have one main group of pest and disease problems relating to that plant species. By creating a poly-culture garden with many varied plant species you will help to create bio-diversity and limit nutrient deficiency in soil and pest or disease problems.

One solution for pest problems is to **encourage birds to your garden**. Place a bird bath, or a few, around your garden to encourage birds to come to the garden. While they are drinking and bathing they will be looking around for their next meal...a great solution to all those chewing insects.

Make sure there's some shade and also a shrub or tree close by for the birds to sit in and check if the area is safe. I love sitting back and watching the birds come to the garden, have a little bath and pick off any bugs eating our plants.

~ Weed Control ~

Another important part of nurturing a garden is weed control. Generally we don't want unwanted plants (that's all weeds are) growing in our garden beds, in pathways and around trees. The easiest method for maintaining a weed free garden is by **sheet mulching** areas.

This is a method of covering the weeds or grass to kill them (instead of using chemicals) which prevents them from growing back. This is also a good way of re-using newspapers, cardboard boxes, old bed sheets or cotton towels.

Soak the newspaper in water, as this stops it from blowing away. Cover the area with a thick layer of newspaper or cardboard, with a 3 cm overlap. You can use bricks or rocks to hold these down. Apply mulch over the paper, either sugarcane, grass, fine bark or other mulches.

This will kill off the weeds and as they break down will add nutrients back to the soil. This is also a method used to start a garden.

If you have weeds growing through paths, pavers or rockery areas apply boiling water to kill off smaller weeds or spray straight white vinegar through pathways or driveways. Hand removal is always a good way to ensure the weed is completely removed and always remove the seed heads as they usually germinate in the soil.

Weeds can be placed in the compost as long as they don't contain any flowers or seeds heads or other runners/nuts, eg never put nutgrass in the compost!! If you're unsure if the weeds are invasive then place them in a black plastic bag, leave in the sun for about 4 weeks and then place in the compost. This will kill off any chance of the seeds germinating.

Garden Maintenance...is an important part of a great garden. If you are in your garden regularly then you will see any problems that may arise. The main jobs to keep on top of are watering, feeding, mulching, weeding, pruning, staking and harvesting. Also keep garden tools maintained to ensure they work properly, are long lasting and also to stop the spreading of any diseases.

TIP - When planting new plants always remove the plastic ties and allow the plant room to move and grow. If necessary replace with adjustable ties.

Regularly check tree ties as the trees grow, trellises for climbing plants, mulches around the garden and also any irrigation systems you have.

Remember ants will nest inside pipes when not used so it's a good idea to flush these out regularly.

Harvesting is also important as you want to enjoy everything you've grown and also harvesting = new growth = more food.

Enjoy a cuppa and walk around the garden each morning to enjoy the space, pick a few healthy herbs and observe what's going on around you. Place a seat in the garden and just be...for a few minutes, you'll be amazed at what you see!!

Thank you for joining me for this Lesson. I hope you enjoyed it and are now ready to enjoy your thriving garden!



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