

# Mackay Community Gardens



## Composting Workshop

### Why Compost?

There are two main reasons for composting:

1. to process food scraps and garden waste
2. to make quality, nutrient rich, living soil to feed the garden

Imagine your compost heap/bin is a lasagne dish. Layer the ingredients into it; e.g. the green waste is the meat, carbon is the lasagne sheets and nitrogen is the béchamel sauce. Water is only added if the mix is too dry.

It's what is in the material that makes the compost. Nitrogen is the key ingredient. There is not enough nitrogen in green matter alone to make the compost work successfully so it can be added as manure, as an organic dynamic lifter or pond weeds.

**Food is only as good as the soil that it grows in.**

And so it goes that;

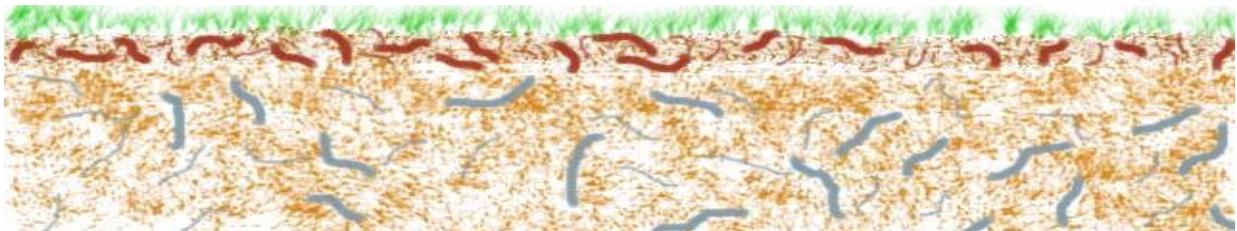
**Meat is only as good as the food it eats.**

**ONLY LIVING SOIL  
allows the movement of elements in the soil  
to feed plants at the root zone.**

LET THE SOIL DO THE WORK FOR YOU

Soil is the planet's skin; the largest organ of a body. The Earth is made up of trillions of micro-organisms, fungi, bacterias, oxygen, carbon, water and trace elements. The more diversity there is; the more complex is the ecology; the healthier it is. Micro and macro-organisms burrow in the soil introducing air spaces in the soil making spaces for other organisms and water to penetrate the soil.

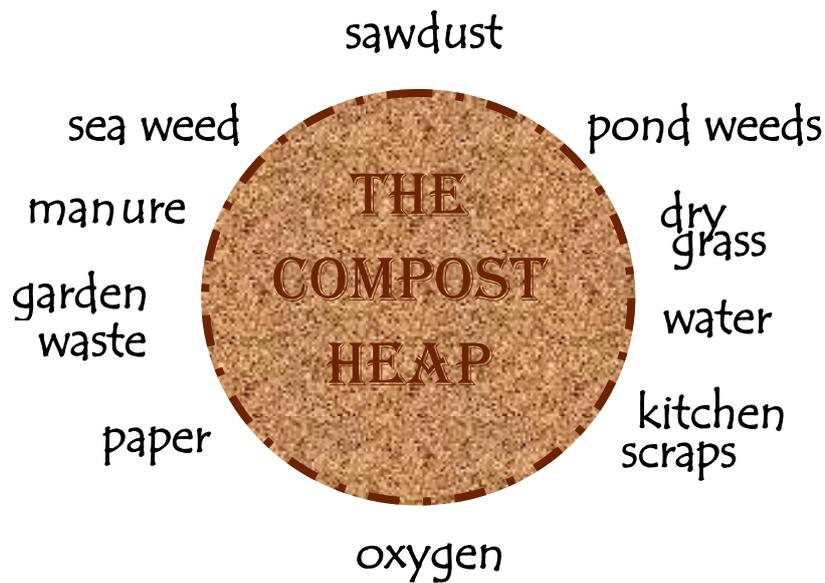
Composting worms work the top 4" of soil, breaking down matter into soil. Earthworms go many metres below the soil taking the composted matter deep into the soil layer and mining deep minerals, bringing them to the surface, feeding the soil and thus, the plants. When the soil is healthy the entire organism is healthy.



Herb- and pest- and fung-**icides kill**. That is what they are designed to do. They kill all the micro and macro-organisms in the soil, effectively killing the soil. If the soil is inert, sprinkle on a little molasses. This provides food and home for micro-organisms.

Sweet soil provides food in abundance.

Eating from the garden creates more waste biomass than fruit and veges bought from the fruit shop or supermarket as they trim the excess from the product before sale. You get only 1/3 of the original biomass of a product.



The essential elements of good compost are:

**CARBON**

**NITROGEN**

**OXYGEN**

**WATER**



## The basic ingredients of compost are:

- **Carbon:** (shredded) paper, hay/straw, wood chip/sawdust, dry leaves; material that was living and is now dry matter (water 10% carbon 90%)
- **Nitrogen:** animal manures (if none is easily available organic dynamic lifter or blood and bone will do), legumes; pigeon pea, beans, pinto peanut, water weeds e.g. duck weed, azolla and water lilies. Seaweed, kitchen scraps, garden waste, fresh lawn clippings, herbs e.g. comfrey, yarrow, dandelion. Nitrogen creates the heat. Not enough and it will be too cool; the heap will not work. Too much creates too much heat which can kill it.
- **Oxygen:** is necessary for compost to breathe to work well; nothing can live without oxygen. When the pile is started on a bed of sticks, oxygen is then incorporated into it at the base.
- **Water:** only add if needed. There is high a water content (75-80%) in the green materials.



Having no animals on site at the Mackay Community Garden, nitrogen must be imported onto the site

This is in the form of organic dynamic lifter and stable manure)



## Compost is a living thing

If you observe the neighbourhood you may notice that many people 'mulch' the council planted street tree with their green lawn clippings. As the lawn clippings begin the natural process of composting, the pile gets part of the way through its process and runs out of nitrogen. It wants to finish composting, so it begins to draw nitrogen from the soil under it, in this case the feeder roots of the tree, effectively starving the tree of valuable nitrogen that keeps it green and the tree takes on a yellow, sickly look. Green material pulls nitrogen from the soil.

This process can be used to eradicate unwanted plants or plants that are in the wrong place. Once the target species has died, plant legumes (such as pigeon pea) to return the nitrogen to the soil.

Composting is a chemical process. Worms, insects and microfauna are mechanical processes. It is these that finish the composting process.

Who has a compost pile at home? Is it working?

Too wet: add carbon. Too dry: add green material. Not working: add nitrogen

**Every ingredient is different and must be evaluated as it goes onto the pile.**

The ratio of ingredients is a changeable thing; analyse each ingredient as it goes on and adjust amounts to suit each ingredient.

Is it green (wet) matter? Is it dry matter (carbon)? Is it high in nitrogen?

Will it incorporate enough oxygen?

### The Black drums – hot compost

This type of composting system is the ideal way to rid your garden of unwanted plants (weeds) and plants that can possibly become weeds.

The same recipe applies; green food, carbon, nitrogen, oxygen, water. Add scraps to the bin all week, then at the end of the week throw in some carbon and a handful of nitrogen.

Do a moisture check; take a sample from about the middle of the drum, squeeze very tightly to see if any moisture runs out. The ideal moisture level will produce a single drop of moisture. If it only just seeps between the fingers, a *little* water can be added. 2 - 3 drips; add more carbon. If it's smelly then it's anaerobic; not enough oxygen. If necessary, turn the pile and add moisture.



Two bins is more practical than one. When the first bin is full and the second bin begun, the first can work happily unattended till the second bin is full. The first bin can now be emptied into the garden and begun again. When this is full, the second bin is ready to empty and so on. Keep a stash of carbon and nitrogen near the composting area to add as needed.

## The 3 bay system

The 3 bay compost system is a great way to compost larger amounts of material. It is a high energy activity and requires a fairly large working area. Keep the ingredients close to composting area for easy use and allow plenty of space to work in, comfortably.

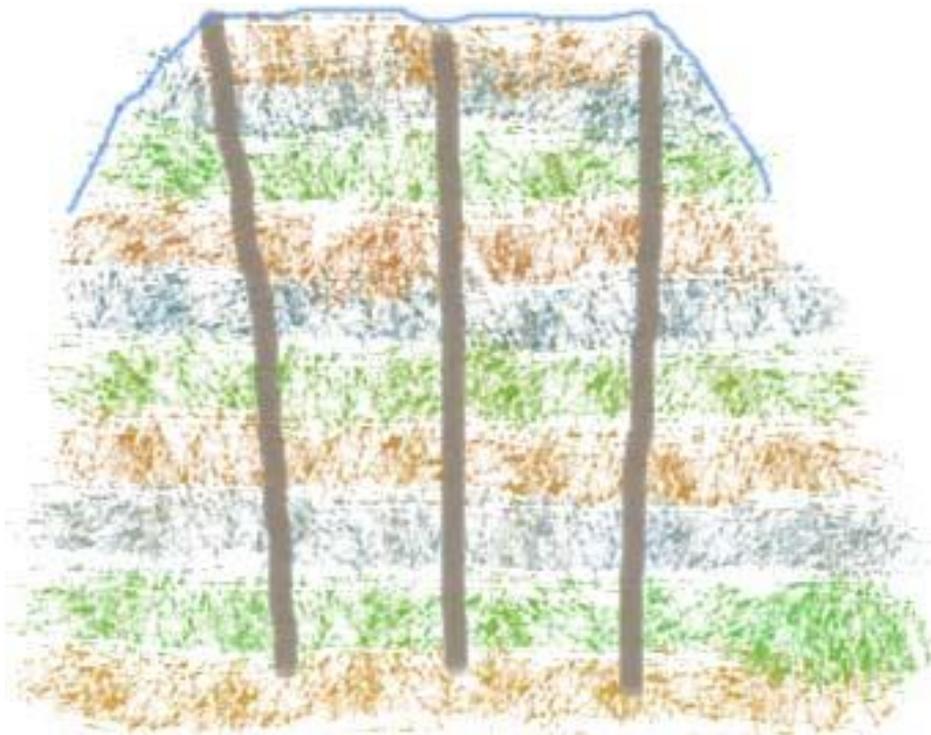
- **Bay 1** is the holding bay. Material gets stored in this bay till it is full.
- **Bay 2** takes the material from bay 1 in layers, with bags of animal manure and a small amount of diluted molasses, if necessary (to create a home for micro-organisms, boosting the microbial activity). Whatever green material is available on the day can be thrown on as well. This will then 'cook' for 1-3 months depending on the weather, season and ingredients.
- **Bay 3** has the material shovelled from Bay 2 and is let sit. The macro-organisms (worms, slaters, beetles, etc) can now move in to finish the composting process. This can be used immediately unless extra nitrogen has been added; then it can sit for a further 2-3 weeks depending on weather and seasonal conditions.



- **The 4<sup>th</sup> bay** holds the sifted compost from Bay 3 which is blended with river sand to make top quality potting mix. Worm castings can be added to this to boost nutrient levels.

## The Compost Heap

Beginning with a layer of sticks and dry palm fronds add the material in roughly 10cm layers, alternating between the different types of material. The free standing compost heap is a 1m cubed pile built all at once with ingredients that have been gathered for the occasion. The same formula applies for this style of composting as with all the others; green food, carbon, nitrogen, oxygen, water. To incorporate oxygen into this pile, build with both large and small particles of carbon and at the end of construction drive a crow bar into 3 or 4 places in the pile. Wiggle it about to create a long funnel that will allow oxygen to enter the pile down to the base. Cover with a tarpaulin or builders' plastic to keep the rain off.



## **The Worm Farm**

For a small garden, worm farms are a great solution. Composting is a chemical process while worm farms are mechanical. Both do the same thing but use different processes to achieve the same results.

**Worm castings have the highest nutrient levels  
of any material created in the garden.**

There are many different styles of worm farms; bath tub, polystyrene box, a bin or a large diameter pipe with holes drilled into one half of it; then that end is buried in the ground and the top is fitted with a cap.

A bathtub is the ideal size for worm farms as there is less that can go wrong. Small farms are very intensive and they must be fed every day. Put the food that they don't like at one end. The worms will go to the best spot and let the unattractive food decay a bit till it has lost its intensity and has become tasty enough for them.

Compost worms eat their own body weight in food every day. With a bathtub sized worm farm it is easy to add the food in one big lot and go away for a week. 1 kilo of worms would require 7 kilos of food for one week. If the worms are hungry, they will leave.

### **Harvesting the castings**

To harvest the worm castings let the worms go hungry (10-14 days). Watch your worm farm to see when they begin to leave. When they do, put a pile of food at one end. All the worms will congregate in the food leaving the rest of the tub largely worm free. Now it is ok to remove 2/3 of the worm castings with the minimum distress and loss of worms. Pure worm castings have the consistency of butter, so add sawdust to make the worm castings friable and easy to use. The pure castings can be added to water as a liquid fertilizer. Humus created by worms regulates soil moisture, keeps the soil damp and allows water to penetrate the soil.

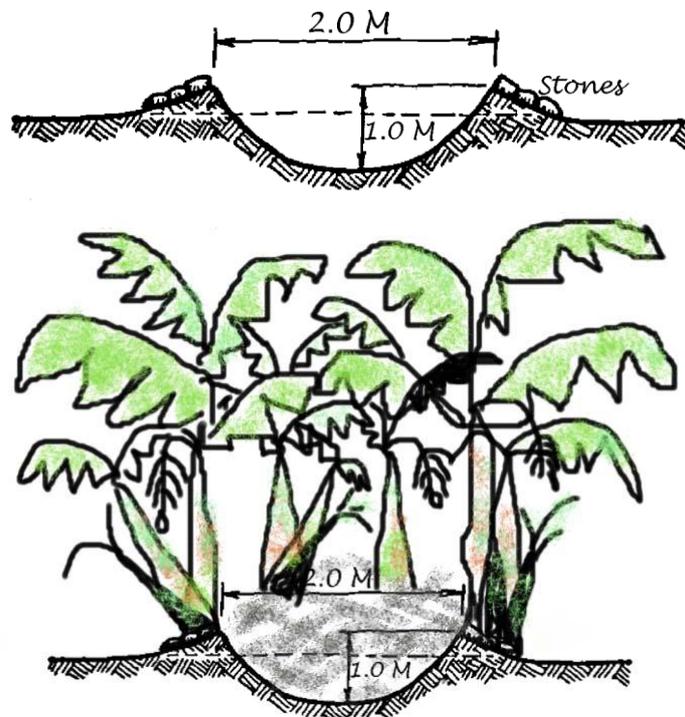
### **Worm tea**

Worm tea is the highly concentrated liquid that drips from the worm farm. Water the worm farm with a watering can and place a bucket below the drain hole of the worm farm. After 24 hours the moisture will have percolated through and become worm tea that can then be diluted 1:10 and sprinkled around the garden.



## The Banana Circle

The Banana Circle is an extremely efficient way of composting large quantities of material. The circle is constructed by digging a hole with a diameter of no more than 2 metres. The material from the excavation is placed around the perimeter of the hole, giving the hole a high edge. Six banana trees are then planted around the edge of the circle in this hill and are then mulched well. Each tree (the Grandma tree) is allowed to keep only one sucker; the Mama tree. The Mama tree is allowed to keep only one sucker; the Baby tree. When the Grandma tree bears its fruit, it is cut out and the Mama tree becomes the Grandma tree and so the banana trees 'walk' around the Banana Circle. Once the Banana Circle is established it will happily 'eat' the palm fronds from all of the immediate neighbours. A railway sleeper will be gone in three months; such is the efficiency of a Banana Circle. It is also a great place to put any spiky material as no-one needs to walk into the centre of the Banana Circle.



**Always dig in or mulch over any compost or worm castings as sunlight oxidises the nutrients.**

How can I make my composting system easier, simpler, better? Have two separate systems close to each other to support each other.

Encourage rampancy in the garden.

The more things that grow; the more raw materials become available to go into the creation of great soil and ultimately;

**GREAT FOOD**

## As we lose clean water, we create immense problems for ourselves

**Comfrey** is a deep miner bringing phosphorous from deep in the soil.

**Bamboo** is high in silica

**Dandelion** is high in zinc, potassium, iron and magnesium

**Parsley** has high levels of calcium, sulphur and manganese.

**Plantain:** calcium and potassium.

All **legumes** fix nitrogen.

**Deep rooted plants** (especially **trees**) mine minerals from deep underground. They bring the minerals up into the leaves; the leaves drop to the ground at the base of the plant. This leaf matter then composts down and delivers the mineral load to the feeder roots of the plant.

Many of the plants at the Mackay Community Garden are grown just for mulch. The 'chop 'n' drop' regime adds leaf matter to the surface of the soil. Larger pieces create 'pillow' of moisture at ground level. Smaller pieces dehydrate faster than larger pieces. Find a happy medium.

Tools for garden management are; secateurs, a pruning saw, a hand saw, a pole saw, a chain saw; shovel, garden fork and a small mattock.

*Permaculture requires  
3 good reasons  
to add any component to the system.  
Do a needs and outputs analysis on any component  
you are considering adding to your system.*



**There are no problems; only solutions.**

## Frequently Asked Questions:

- What can I put into my compost bin/worm farm?  
Limit the quantities of citrus, onion family (alliums), pineapple, tomato, etc; anything with a high acid content.
- Put meat scraps through the chooks first. Pretty much any green material is ok.
- Human waste? This is dependant hugely on the individuals' diet. Too much inorganic content makes it unusable. At best it must be **very well composted** and used **only** on the orchard or other trees.
- Eucalyptus leaves? They repel moisture so sprinkle only a few in each layer
- Wattle leaves? OK
- Mango leaves? OK
- Palm fronds? Use them to begin the pile or add them to the banana circle; convert a problem into food.
- Ash? Is best to go through the chooks first as it is too alkaline to put directly onto the compost.



Notes: