

COMPOST! is not a dirty word

We know the word, we see the bags in the nurseries and large warehouse stores, but what really goes INTO compost? Is it *really* that difficult to make? And what did our grandparents (and parents) use before the stores had this stuff packed into plastic bags for "ease of use"?

Back in the day (bear with me) old Guiseppe use to trade his chook manure for some zucchini from John up the road, who use to swap that for some sawdust with Albert down the street, who had horses for the "night cart" and could supply everyone with oodles of horse manure. They use to MAKE their own compost (God forbid) using whatever they had, with whatever they could trade. My own Poppa used a 3 bin system and as kids we were FOREVER having to transplant pumpkin, tomato and zucchini seedlings from the compost heaps into the garden .. somewhere .. between the roses perhaps ...anyway .. the magic words that make compost?



***** ORGANIC MATERIAL!!! *****

Oh yes indeed. You'll find these words being used in any high tech gardening chatter, along with a cup of tea and an Arnotts™ Kingston biscuit. Organic material? Compost is simply made up of a balance of carbonaceous and nitrogen organic waste materials and the balance of these two is called the Carbon:Nitrogen ratio, or C:N for short. Get this balance right and the composting microorganisms will thrive.

Compost Ingredients

Carbon – think brown & dry (40-50% carbon)

- Leaves - deciduous tree, straw & hay, saw dust, wood chips, paper & cardboard (just keep an eye out to avoid suspect dyes, glossy magazines etc..), dead plants

Nitrogen – think green & fresh (10 – 20% carbon)

- Grass clippings, fresh green weeds & leaves, green hay, vegetable & fruit waste (kitchen scraps), farm animal yard straw/bedding (added manure a bonus!), aquatic weeds (oh yes indeed), coffee grounds egg shells, manure (the good old, untouched, unmessed with stuff) – cow, sheep, alpaca (very good), horse, goat, rabbit .. any manure that comes from a herbivore.

These are your waste materials, and we must consider and remember that every waste material has its OWN special C:N ratio (see table below). This is not to be confused with the overall 30:1 compost ratio we will hear thrown around willy-nilly.

COMPOSITION OF SOME ORGANIC MATERIALS			
Material	% carbon by weight	% nitrogen by weight	Carbon:Nitrogen ratio
Chicken Manure	30	4.3	7:1
Cow manure	20	1.7	12:1
Food scraps	8	0.6	15:1
Green weeds	6	0.3	19:1
Lawn Clippings	8	0.3	20:1
Seaweed	8	0.3	25:1
Straw	36	0.4	100:1
Paper	36	0.2	170:1
Sawdust	34	0.1	450:1

Decomposition of organic materials in your compost pile is greatly increased when you create the proper balance between the carbonaceous materials and the nitrogen-rich materials. It does NOT mean that you need a volume of brown material that is thirty times great than the amount of green matter.

Fine particles and coarse particles. What are these and why are they important? As well as brown and green matter (carbon and nitrogen) please consider the sizes of the particles you're adding. It is good practice to have a variation in the greens and in the browns themselves. For example, think of making up your greens with 1 pile of lawn clippings (fine greens) with 1 pile of coarsely mulch green leaves, green hay, large vege scraps. Same thing applies to your browns. Sawdust is fine so match that with something coarse like straw.

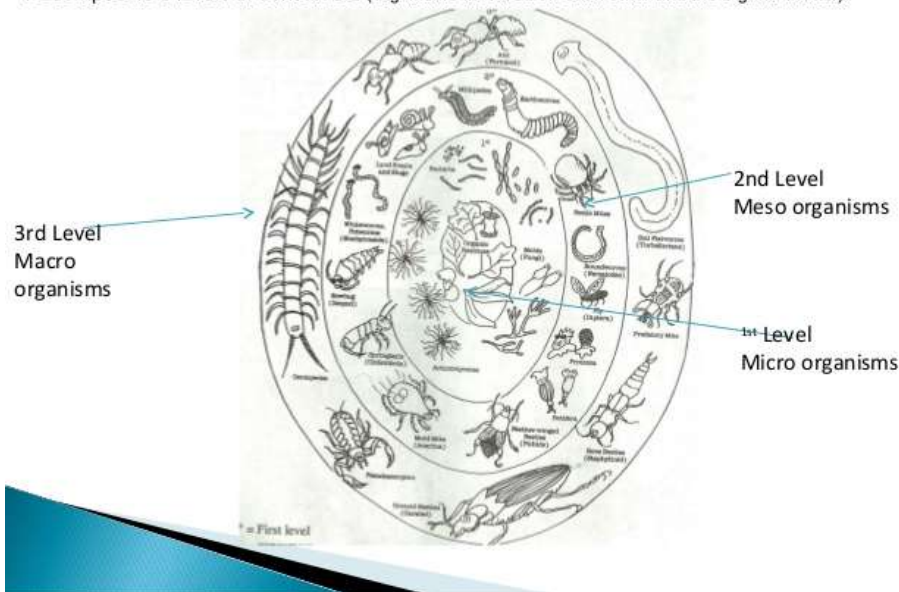
Activators, minerals and trace elements. In addition to your waste materials, we can also add activators to speed things along such as molasses (diluted), kelp (diluted), liquid worm castings (diluted to weak tea colour), sour milk, old compost and herbs (borage, comfrey, yarrow, stinging nettles). Simply have these ready in watering cans to add between layers of carbon and nitrogen.

Because our soils in WA are mostly deficient in minerals and trace elements, it is also good practice to add these in layers to your compost and the most cost efficient and easiest is by way of **rock dust**. This is readily available in powdered form.

So what does all the hard work and turns the organic material into compost? **Composting organisms** (micro, meso and macro organisms) these guys are the do all and end all of composting. Generally speaking, the microorganisms that digest compost need about 30 parts of carbon for every part of nitrogen they consume (there's that optimum C:N 30:1 again). If there's too much nitrogen, the microorganisms can't use it all and the excess is lost in the form of smelly ammonia gas. What a waste of nitrogen. Too much carbon will result in the heat production dropping and decomposition slows, too much nitrogen and the excess will gas off in the form of ammonia gas (stinky!). However! The C:N ratio does not need to be exact though, there is room for movement.

Processes in Composting

Decomposers 3 levels of consumers (organisms that feed on each other and the organic matter).



Factors that affect composting

Air: proper aeration is a key environmental factor. Many microorganisms, including aerobic bacteria, need oxygen. They need oxygen to produce energy, grow quickly and consume more materials. Pretty much like us! Aeration involves the replacement of oxygen deficient air in a compost pile with fresh air containing oxygen. Natural aeration occurs when air warmed by the composting process rises through the pile, bring in fresh air from the surrounds. Air flow can be greatly affected if large quantities of finely sized materials such as pine needles, grass clippings, sawdust etc.. are added OR if the materials become saturated. The easiest way to put air into a compost pile is to turn it with a pitchfork or shovel. This will fluff up the pile and increase its porosity.

Moisture decomposer organisms need water to live. Microbial activity occurs most rapidly in the thin water films on the surface of organic materials. A general rule of thumb is to wet and mix materials so that they are about as moist as a wrung-out sponge. Material should feel damp to the touch, or with just a drop or two of liquid coming out when you squeeze it with your hand. If a compost pile is too dry, it should be watered as the pile is being turned or with a trickling hose. In Summer you can prevent excess water evaporation by covering your compost pile with a old piece of heavy duty cardboard, non treated wood (old door cut in half) or a tarpaulin.

Temperature such an important factor in composting and is related to proper air and moisture levels. As the microorganisms work to decompose they release heat which in turn increases the pile temperature. Temperatures around 55°C indicated rapid decomposition and kill of pathogenic bacteria and fungi like E. Coli, but temperatures greater than 70°C reduce the activity of most organisms. Lower temperatures signal a slowing in the composting process.

Aim for temperature of 55°C - 70°C for at least 3 days in all parts of the compost. Compost must be turned to achieve adequate temperature throughout the pile. Turn the compost every time the compost approaches 65°C to maintain adequate temperature throughout the pile. Compost thermometers are available from many garden centres and suppliers.



Volume

In order to become self insulating and retain heat, piles should ideally be about 3m³. The larger size retains heat and moisture, but is not too large that the material will become unwieldy for turning. Smaller compost piles will decompose material but they may not heat up as well and decomposition is likely to take longer. Who wants to wait? The more “surface area” available the easier it is for the micro organisms to work. Similar to the principle of creating more surface area in a biological filter housing. And remember where I said earlier that you need to be careful of the particle SIZES of what you’re adding to your compost pile. Now you know another reason why. It’s all about the balance of little things with big things.

So – how do we bring this all together?

How to Make a Batch Compost Pile

Fast Results (1-3 mos) BUT Takes Planning!

Ask Yourself:

- Do I have an empty bin ready to fill?
- Have I stockpiled enough **brown & green** materials to fill a bin?
- Do I have a sweet treat ready to reward myself when done?

Step 1

Coarse materials on bottom

Place about a 3-inch (7cm) layer of the coarsest materials (stalks, straw/hay, small twigs, tall weeds) on or near the bottom of bin. Chop them well to increase surface area for faster breakdown

Step 2

Build pile up as follows:

- Add 2-3 inch (5-7cm) layer of moist **green** materials
- Add 2-3 inch (5-7cm) layer of drier **brown** materials and moisten using spray nozzle of hose
- Repeat this layering & moistening until bin is full
- Pile should have the consistency of a wrung-out sponge

Step 3

Optional Use of Activator:

As pile is building up, intermix layers of a nitrogen-rich activator (especially on top of food scraps or smelly items) — a little goes a long way!

Step 4

Cover pile/bin

To retain moisture & heat, and to keep animals out. Insure good air flow around and into bin

Step 5

Optional Turning:

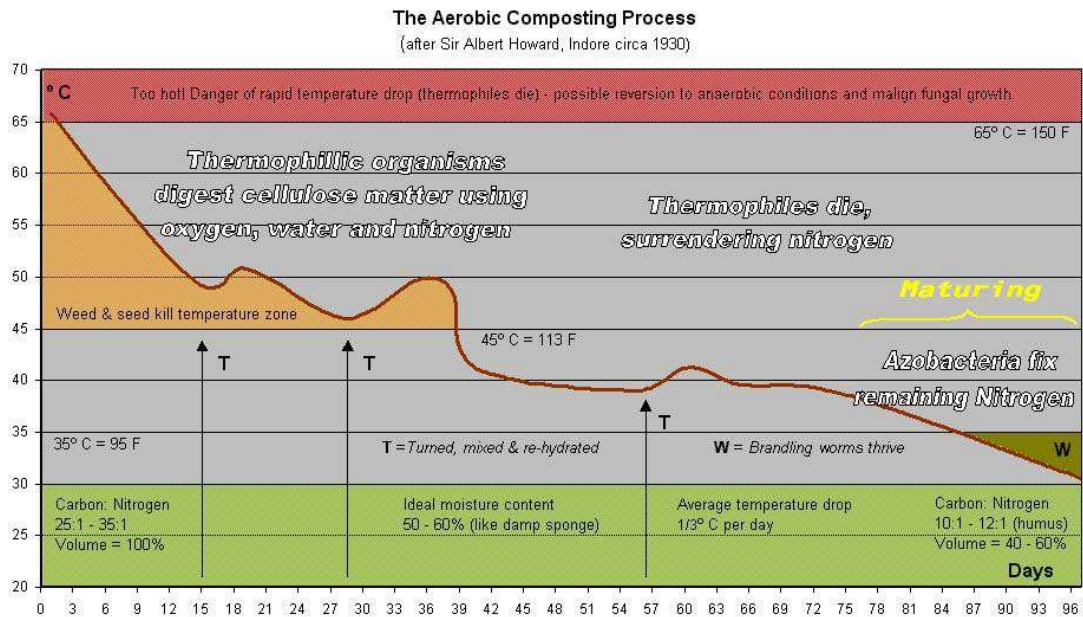
Turn pile (garden fork, shovel, or compost turner tool) every 7-10 days. This brings outer layers into the center where temperatures are hottest. Turning creates passages for air and moisture, thereby causing re-heating and faster decomposition

Step 6

Check moisture level

Do this weekly. Add water to maintain consistency of a wrung-out sponge

The table below is practically an instruction sheet on what to do and what's happening when you do it, once you've mixed all your ingredients together.



Once your compost is finished, you can “water” it down with sand to create a great garden bed soil, use it around your fruit trees, apply as a thin layer under mulch, or use it in lasagne beds for immediate garden beds (utilising another composting method) or you can make compost tea (see attached instructions).

Examples of setting up composting areas and other methods of composting



3 bay system



compost bin



Compost tumbler (home made)



Bokashi compost

If you want to compost as you plant you may consider **Lasagne Beds** as another method. This requires very little effort, not turning and you can plant straight into it! You can add your activators inbetween layers, plus blood and bone, seaweed/kelp/worm tea solutions, rock dust etc...

What is Lasagna Gardening?



A no dig, no till garden made by layering

Also known as "sheet composting," this time and labor saving technique builds a garden bed quickly. The organic materials are layered like a lasagna. These layers rot in place, and create a bed that can be planted immediately!



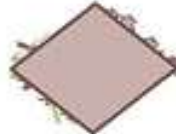
LAYER 1:
10-15 sheets of overlapped newspaper or 1 layer of thick cardboard to kill the grass and weeds.



LAYER 2:
Add a layer of woody material like small to medium sized branches and twigs.



LAYERS 3-8:
Add several alternating layers of greens (fresh material like vegetable scraps, fresh cut grass, manure) and browns (dried materials like dried leaves, straw, paper).



LAST LAYER:
If you want to plant it right away, cover the top of your pile with a layer of 1-3 inches of compost or soil.

The difference between those browns and greens:

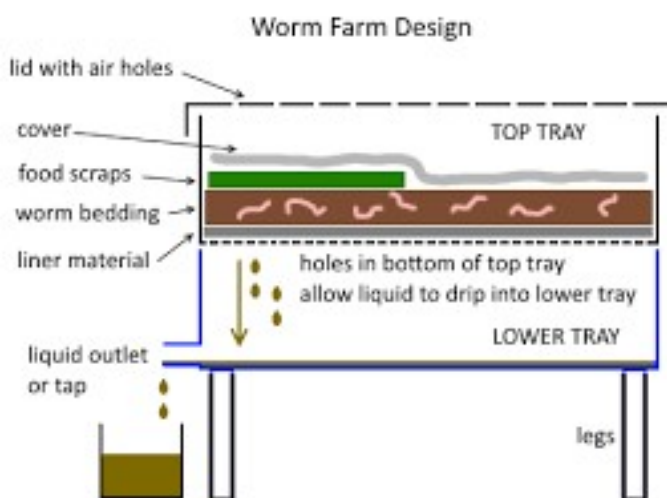
Greens are rich with nitrogen. Greens are fresh, "wet" organic materials. Fruit and vegetable scraps, fresh cut grass, coffee grounds, seaweed, and manures are all considered green.

Browns are carbon rich. Browns are dried organic material like straw, woody material, paper, dry fall leaves, and woodchips.



Vermicompost – recycling using worms

Worm farms are easy to buy but are even easier to make using recycled material. Foam boxes, decommissioned fridges, bathtubs, plastic bins, concrete laundry trough or even a half perforated plastic pot half buried in the ground that you put your veggie and kitchen scraps into (no meat or dairy please! You can use Bokashi composting for that).



One of the easiest ways to recycle organic waste is to set up a worm farm. Particularly for urban environments or the novice composter, worm farming is the best. They recycle by digestion decomposing organic matter and converting it into a form easily digested by plants as nutrients. They also till and aerate the soil, eating at the surface excreting lower down and by doing so introduce organic matter to the deeper levels and increase the depth of the previous topsoil. They can eat their own body weight EACH day.

COMPOST TEA

