**Basic compost science**

Four necessities ompost

Moisture, oxygen, temperature, carbon/nitrogen balance. (20 to 30 parts carbon to 1 of nitrogen). Too much nitrogen results in ammonia gas and nutrient losses. Compost bacteria combine carbon with oxygen to produce carbon dioxide and energy.

Four stages of compost:

1. Mesophilic phase. This is the first phase and temperatures can reach 44C. Large numbers of bacteria are present, including E. coli.
2. Thermophilic phase. Thermophilic microorganisms proliferate and boost temperatures up to 70C. (Not really desirable) This stage is fast and brief, and may be localised in only one area. This does not digest the coarser material.
3. Cooling phase. Lower temperature microorganisms migrate back into the pile and start digesting the coarser material. Fungi, myceliums and macroorganisms such as earthworms digest coarser materials such as lignins.
4. Curing phase. A long and important phase, can last up to a year, and adds a safety net for pathogen destruction. Immature or uncured compost can produce phytotoxins, robs the soil of oxygen and nitrogen and can contains high acid levels.

Batch compost and continuous production.

Municipal and “industrial” composting systems usually make compost in batches where these four phases are easily identifiable. They are often strapped for time and are tempted to shorten the cooling and curing phases.

Domestic or small scale systems can easily keep adding materials on a daily or weekly basis and the phases run into each other, often occurring at the same time in various parts of the heap. The curing phase, however, is still very important and might be extended for a full year to ensure full composting of all parts of the pile.

A teaspoon of natural grassland soil will contain:

600 – 800 million bacteria comprising 10 000 species.

5 000 species of fungi.

10 000 individual protozoa of 1 000 species.

20 – 30 different nematodes from 100 species.

Turning compost leads to loss of organic matter and nitrogen, is expensive and/or labour demanding.

You can compost ANY organic material, though teeth and bones will take a VERY long time.