

# COMPOSTING

**BULKY ORGANIC MATTER** (equal proportions of...)

1. Retail Vegetable Waste /
2. Crop Residues /
3. Cattle Manure

**SMALL AMOUNTS** 1. Hay / Straw 2. Paper / Card 3. Nettles / Comfrey

4. Annual Weeds / Perennial Weed Tops Not Roots

**ADDITIVES** 1. Seaweed Meal 2. Volcanic Rock Dust 3. Magnesium Lime

4. Compost Activator (Urine 9% Nitrogen)

**INNOCULANTS** 1. Mature Compost ( Micro-Organisms / Eisenia Foetida + Eggs)

2. Loam / Topsoil (Micro-Organisms)

3. Biodynamic Preparations (Homeopathic Doses)

**SITE** Right-angled walls / boarding + temporary dividing boards (pallets etc.)

Soil or loose brick floor (drainage + firm chopping surface )

Heap supported on three sides / front open for loading

Base area = 7 ft x 7 ft / 2 m x 2 m                      Height = 7 ft / 2 m

**Chopping vegetable waste** using sharp spades. Especially matter which will regrow (onions /beetroots etc.), resist breakdown (citrus) or is woody (brassica stalks / avocado and mango seed).

## **STACKING**

- Bottom layer spongy, dry material (e.g. hay / straw): to soak up leachate + firm stems to support material above and allow air to be drawn into the base of the heap
- Alternating layers of bulky organic matter (3-6 inch / 10-15 cm) + additives.
- Insulate raw material (veg/hay) by putting manure at the edges of the heap.
- Flatten each layer so that it is horizontal.
- Firm up front to build a near-vertical face.
- Add intractable materials to upper layers, the hottest part of the heap.
- Top dome-shaped (parabolic) so that condensation evaporates.
- Capping top with soil to insulate and inoculate.

## **COVERINGS:**

1. Soil, Paper or Card to soak up water vapour
2. Plastic sheet to retain moisture and ammonia gas
3. Carpet to insulate and retain heat

**TURNING:** INVERT AND RESTRUCTURE INSIDE-OUT AND UPSIDE-DOWN.

**FIRST TURN** (using forks) after 2-4 weeks. Heap will reheat to 40 °c

**SECOND TURN** (using spades) to chop through heap in 3 inch / 10 cm slices after 4-6 weeks.

Less heat / maturation phase / inoculate with mature compost

**ARRANGMENT OF COMPOST AREA:** Heaps next to each other to permit worms to migrate from mature to recent heaps.

**STOCKPILING:** A backlog of heaps left to fully mature for 6-9 months+.

## **TYPICAL PROBLEMS FOR BEGINNERS:**

1. **SIZE:** Insufficient material piled at the same time . If the volume of material is less than 1 m<sup>3</sup>, there will not be sufficient critical mass to generate the chain reactions of microbes which produce heat.
2. **BALANCE OF INGREDIENTS:** Excess amounts one type of material in initial mix.
3. **TURNING:** To extend thermophilic breakdown and homogenise ingredients.
4. **BOXES:** Sides too open allows wind to dry out material at edges.
5. **COVERINGS:** Must be sufficient to retain heat and moisture.

# COMPOST CONCEPTS

The composting process can be understood as two related but distinct processes:

## 1. DECOMPOSITION BY MICRO-ORGANISMS 6-8 weeks

Bacteria, fungi, yeasts, algae, protozoa and actinomycetes break down the raw materials and feed off each other. Successive flushes of micro-organisms spread through the heap. Heat is produced in the insulated environment of the heap by thermophilic bacteria.

## 2. RECOMPOSITION BY MACRO-ORGANISMS 3-9 months

The longer stage of maturation by worms digesting the material broken down by micro-organisms and forming it into improved, stable humus (vermicomposting).

### THE CARBON TO NITROGEN RATIO.

Chemically, the composting process can be understood as the combining of carbon and nitrogen to form complex carbohydrate proteins which will bond onto clay particles to form humus. Ideally, the initial mix should contain about 30 times more carbon than nitrogen. Mature compost will end up with 10 times more carbon than nitrogen.

**MATURE COMPOST** is DARK, CRUMBLY, SWEET-SMELLING.

**HUMUS MOLECULES** can hold ten times more water than an equal amount of sand.

**USES** (at stages of maturity):

3 MONTHS (after Decomposition) --- MULCH / SURFACE DRESSING / DON'T DIG IN

6 MONTHS (Recomposition beginning) --- INCORPORATE INTO SOIL

9-12 MONTHS (after Vermicomposting) --- ANY USE INCLUDING POTTING MIXES

**APPLICATION RATES:** 5-10% OF SOIL VOLUME / 5-10 METRIC TONNES PER ACRE, depending on crop and soil quality. The more mature a compost is, the more stable humus it will contain and the easier its fertility will be taken up by plants' roots.

**MICRO-ORGANISMS.** Populations of several billion per teaspoonful.

Some soil bacteria (**NITROBACTERS**) specialise in digesting nitrogen. Topsoil or loam can be used to deodorise boots and bins covered in smelly, slimy material.

**PHAGES** viruses which consume bacteria. Used to treat infections in cases of antibiotic resistance.

**SEASONS.** Spring and autumn (the equinoxes) are better times for composting than summer and winter (the solstices) because the temperature is neither too hot nor too cold, and the weather is neither too wet nor dry. During March - April and September - October, composting will be faster and more vigorous. Airborne spores which also inoculate composts are more prevalent in the autumn.

**BALANCE.** The composter should try to combine the greatest diversity of inputs possible to maximise the health and vigour of the compost and the growth-potential and flavour of the plants it fertilises. If the initial combination of materials is balanced, the whole process will be optimal. One way to conceive of this is to try to provide all that is needed mechanically for the process: aeration or ventilation, moisture-cycling by evaporation and condensation and insulation to retain heat. This could also be thought of as a balance between the elemental forces: fire, earth, air and water; or between the four humors: hot, dry, cold and wet. With this in mind, a judgment can be made about how varying inputs will affect the mix. For instance, different manures can be categorised according to whether they are hot and dry (like straw horse manure), cold and wet (pig / human) or balanced (cattle).

**BIODYNAMICS.** A system of ultra-organic horticulture and agriculture which acknowledges the existence of subtle natural energies and advocates sensitive cultivation in harmony with these influences. Planting with the moon (sow seed before full / transplants or cuttings before dark). Preparations used to inoculate compost heaps contain homeopathic doses of yarrow, chamomile, nettles, oakbark, dandelion and valerian, which improve the environment for micro-organisms.

**ALCHEMY.** Composting has often been described as an alchemical process of converting base materials into higher, more valuable forms. It can be used to transmute substandard, diseased, inorganic and contaminated matter into organic-standard humus to feed and improve the health of soils, the plants that grow in them, and in turn, the humans that eat their produce.