

## GUIDE TO ON-FARM COMPOST PRODUCTION



To make high quality compost, attention must be paid to three critical factors:

1. recipe
2. aeration
3. moisture control.

Badly made compost is a pile of decaying organic matter that could be harmful to plant health.

### What is needed?

For a finished pile of about 30-40m<sup>3</sup> you will need:

- 80-100m<sup>3</sup> of starting materials.
- For a fungal dominated compost:
  - 15-25% high nitrogen material, *e.g.* animal manure or high nitrogen leafy material. Grass can be used although the carbon to nitrogen ratio will vary with age and time of year.
  - 30-40% green material, *e.g.* old coarse grass or mulch with a high proportion of leaves.
  - 45% woody material. At least 10% of the pile should be particles larger than 2.5cm.
  - The more diverse the start-up ingredients, the more diverse the microbial activity.
  - Enhance the compost with fish, seaweed, lime or gypsum to add Calcium, humic acid, and wood ash for Potassium (no treated timber ash).
  - Small amounts of fertiliser, less than 1 kg per m<sup>3</sup> of finished compost may be added as the compost is turned.
  - Include at least some lime.
  - Microbial inoculum from mature compost or other sources.
  - Bio Dynamic preparations can be used to improve the compost quality.
- A flat area about 60m long and 20m wide. Surface run off needs to drain away from this area.
- Heavy vehicle access if materials are brought in.
- Machinery or a contractor to mix and turn the pile.
- Cover for the later part of the process to prevent the pile from becoming too wet.
- Chlorine free water to prevent the pile becoming too dry and losing nitrogen to the air.

### Turning the Heap

- Windrow the pile to a minimum width and height of 1m, maximum width 2.5m, max height 1.5m. This is important for temperature regulation.
- Read the internal temperature of the pile with a soil thermometer.
- Turn the pile frequently, once every two or three days for two or three weeks until the internal temperature stabilises.
- Compost applied to a certified organic orchard supplying the U.S. market must comply with NOP standards. This states the compost must have a C:N ratio of between 25:1 and 40:1 and to have been maintained between 55°C and 77°C for a minimum of 15 days having been turned at least five times during that period.
- Avoid a pile temperature higher than 65°C as it will destroy some beneficial microbes.
- A two-wheel drive tractor with a bucket will have difficulty pushing material and cut up the ground much more than a four-wheel drive tractor.



- A bobcat is very quick but can cut the ground up.
- A digger can turn the pile efficiently, use less space and is easy on the ground.
- PTO driven compost turners are best for large scale manufacture as the capital outlay is justified. Such a machine speeds up making the compost and gives an even, homogenous mix with the windrow shaped to the ideal size.
- Don't turn the pile in wet conditions as the ground will be turned into an unworkable mess.



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### Maturing the Pile

- If the compost is simple materials, such as straw, the high temperature stage can be complete in two or three weeks. If the carbon materials are complex, such as high resin or rot resistant woody materials, the high temperature stage can go for several months.
- Once the internal temperature starts to fall below 50°C the maturation phase has begun. Leave the pile unturned to allow the fungal biomass to develop.
- Maintain the moisture content of the pile by adding water and covering to prevent over saturation during heavy rain.
- The compost should be moist to touch but not yielding droplets when squeezed by hand.
- It is best to have a maturing phase of two to six months to allow high amounts of fungal biomass to develop; humus development may occur after about six months.



Freshly turned compost during the high heat phase.

### Passive compost

- This is simple compost made by mixing the ingredients but with minimal turning.
- A mulch rich in microbial food, organic matter and some microbial activity.
- Easy to manage but takes up to two years to mature.
- High internal temperatures are possible where all the oxygen in the pile is used. The resulting anaerobic conditions kill beneficial aerobic organisms and may produce phytotoxic compounds.
- Avoid high nitrogen materials, such as grass and large amounts of green leaves, these promote high temperature conditions.
- Add large woody particles to allow more airflow through the pile.
- Windrow no more than 1.5m high.



Compost covered to manage moisture levels.



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