



NSW Agriculture

# Organic materials in horticulture – their safe use

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Organic materials are used in vegetable, vine and tree crop production for nutrition and soil improvement. Organic material includes plant materials (including straw, sawdust, rice hulls, crop residues and food wastes), animal manures, seaweed, fish by-products and any other materials that are derived from plants or animals. These organic materials may contain microbes that can cause human illness and care should be taken in their use. Produce can be contaminated if the organic materials used to grow them are not treated and handled correctly.

## What is compost?

Compost is made from any combination of plant or animal materials. 'Composting' is the conversion of raw organic materials to humus through biological agents. The process is generally managed by heaping, aerating and turning the organic materials over a period of time. This allows microbes to digest the raw materials into a form that can be more easily used by growing plants.

During composting, the 'good' microbes (thermophilic) break down the raw materials and produce heat that reduces the 'bad' microbes (food poisoning) that can cause human illness. This heating process also breaks down or neutralises other contaminants in the organic materials such as weed seeds.

The compost heap must remain aerated and the outer layers must be turned in for the process to work. All of the organic material needs to be exposed to a minimum temperature of 55°C for three consecutive days.

The time taken for complete composting of organic materials depends on the system used and factors such as the type of material, moisture content, aeration, nutrient ratio, pH, toxic substances and temperature. Common



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systems used in composting include turned pile, aerated static pile, windrow and in-vessel.

Generally it takes between six and ten weeks (with a further curing period of two to three months) to ensure that the compost is mature. When you compost material on your property, keep a record of the dates and method of composting used.

## Managing the risk of organic materials

Before using any organic material or compost, you should assess the risk of it contaminating the produce you grow. Many of the food-poisoning microbes can be found naturally in the guts of animals and so may be present in their untreated manure. Other sources of materials can also support the growth of food-poisoning microbes.

Contamination can occur through direct contact of the organic material with the edible part of the crop (soil or foliar application) or indirectly through contact with contaminated soil or water used for irrigation and for washing produce.

When using organic materials in horticulture production you should store, apply and dispose of them using methods that minimise the risk of direct contamination of produce or indirect contamination through the water supply.

There are a number of ways to minimise the risk of contaminating your produce.

- Use an application method or growing practice that minimises the chance of the untreated organic materials coming into contact with the edible part of the crop.
- Work the organic material into the soil within 36 hours to minimise contamination from wind drift or rainfall runoff.
- Maximise the period between applying the organic material and harvesting the crop. Do

not apply untreated animal manure after planting where direct or indirect contact may occur with the edible part of the crop.

- Compost or age the animal manure to reduce microbe levels. Composting is more effective than aging.
- For proprietary (trade name) organic products, use products that have been treated in their production to minimise microbe levels.
- For side-dressing, only use properly composted material or treated proprietary organic products that contain less than 100 *E. coli* per gram. Ask the supplier for evidence/certification that this limit is not exceeded.
- Avoid applying organic material or organic products over the top of produce. Do not apply the side dressing within two weeks of harvest.
- If stockpiling animal manures on-farm, locate the pile to avoid contamination from wind drift onto adjacent crops and harvested produce, and from rainfall runoff into water sources.

Keep records of the materials you purchase, the composting method and applications, including:

- date of purchase
- name of the product and supplier
- dates and method of composting
- date of the application
- location of the treated area
- rate of application
- name of the person applying the product.

The safe use of organic materials in horticulture production depends on good management practices.

## Further information

Further information on food safety risk assessment in relation to the use of organic materials in fresh produce production can be found in the *Guidelines for On-Farm Food Safety for Fresh Produce*, Agriculture, Fisheries and Forestry, Australia, 2001.

Full details of the types of composting systems available and detailed guidelines on procedures required can be found in AS 4454-2003: *Composts, soil conditioners and mulches*, from Standards Australia.

Information on the nutritional characteristics of various organic materials that may be mixed to form composts and guidance in how to conduct composting can be found in the NSW Agriculture Agnote *How to compost on-farm*. (DPI-448, 2003)

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