



NSW DEPARTMENT OF  
**PRIMARY INDUSTRIES**

**Emergencies, Weeds & Pest Animals Branch**  
PMB 8 Camden NSW 2570  
Tel: 02 4640 6467 ; 02 6391 3680  
Email: emergency.preparedness@dpi.nsw.gov.au

## Procedure – Disposal of birds by composting

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<b>Prepared by</b>	Kevin Cooper, Leader Animal, Plant & Fish Health Emergency Preparedness & Response		
<b>Contact Officer</b>	Field (IP) Operations Manager – FRT		

### REVISION HISTORY

Version	Date	Amendments	
		Section	Details
1	23 Nov 05		For approval
2	26 July 07	All	Update to be consistent with Composting large animal procedure
3	1 Sep 08		Re-formatted

## 1. Application / Scope

- Composting here refers to above-ground aerobic decomposition of dead birds. It does not in this instance include anaerobic decomposition (above-ground burial).
- Windrows are constructed to promote aerobic composting by allowing the flow of oxygen through the pile. The organic matter reduces odour, attracts few insects and absorbs leachate from the decaying carcasses.
- Composting is one of several options for the disposal of dead birds. Composting may also be an option for holding dead birds pending their disposal by another means.
- Composting may be used for either small or large numbers of dead birds.
- Composting is best undertaken as soon as possible after the birds have been killed. Composting can be undertaken at any time, within the limits of handling decomposed birds, post the death of the birds.
- Composting may be undertaken either inside a building such as a poultry shed or other shed of similar size and design, or in an open paddock/field.
  - In shed composting – this approach
    - Reduces access of free flying birds to the compost,
    - Prevents rainfall falling on the compost and subsequent runoff;
    - Reduces the effects of wind on the compost;
    - Reduces dispersal of aerosols from the litter and dead birds;
    - Provides opportunities for controlling any pests that may access the compost;
    - Will extend the time the shed is out of use because the decontamination cycles will follow the compost removal.

In shed composting may be used either when birds have been killed in a shed or killed elsewhere and transported to the shed. Composting cannot be done in layer sheds with cages.

- In a paddock – this approach requires:
  - Control run-on and run-off from rainfall;
  - Considerations of the water table depending on soil type etc;
  - Management of potential pests eg free flying birds, insects, foxes and feral pigs;;
  - Use of plant/heavy machinery to construct and manage the compost.
- This procedure does not describe the end use of the compost post the composting cycle. The compost should be “disposed” of in a suitable area after the following considerations:
  - Isolation from poultry farms;
  - Isolation from dwellings and other areas frequent by people;
  - Run off to dams, water ways etc
- The end product can be held for an extended period in a stockpile and can be treated as non contaminated.
- The composting process will reach temperatures high enough to kill NDV and AI virus. The actual composting process will also degrade other viruses and bacteria.
- There is a possibility that the community may see a risk associated with composting. The community and neighbours in particular should be kept informed of the on site actions.

## 2. Abbreviations / Definitions

## 3. Resources / Equipment

The resources vary depending on whether the process is conducted inside a shed or outside in the open.

Both in shed & in the open

- Organic matter – approximately a third by weight of the total weight of the birds to be composted. Used litter is satisfactory if it is covered by clean material.

Other options include mulched green waste, silage. Wood chips can be used but the composting process may be slower than material with pre-existing micro-organisms. Coarse material such as hay should be ground (to maximum 5cm length) and combined with manure/litter to reduce compost times and increase initial temperatures.

- Where the compost is imported from an outside source, there maybe a risk associated with the potential transfer of weed seeds, insects and other pests, and endemic pathogens. These risks need to be assessed and managed appropriately.
- A stockpile of excess organic matter is required for windrow maintenance.
- Personnel to operate equipment and plant (typically approx 6 to a crew)
- PPE – as for Personal Decon kit (see SOP) including respiratory protection, sun protection, reflective vests (for working around plant) and hard hats subject to clearance inside sheds.
- Ready access to facilities for personal hygiene and adequate supplies of potable and drinking water.
- Equipment to measure:
  - temperature inside compost windrow eg data logger that can be buried (by sliding down PVC tube into compost)
  - pH and moisture content at time of windrow construction
- Facilities for decontamination of personnel and equipment exiting composting site.
- Hand tools such as shovels, pitchforks, rakes, broom. Ladder may be required.
- Pest control measures eg bait stations, fencing (maybe electric).
- Water supply from a hose or similar.
- Signs to restrict perimeter entry to compost site/shed.

In shed

- Ready access to shed by vehicle and plant eg wide end and/or side door – especially important where the dead birds are moved between sheds. Similarly additional compost may need to be added to the shed.
- Front end loader/bobcat that can operate in the shed.
- Transport for organic matter within site.

## In open

- Current and weather for period to construct compost windrow.
- Plant, equipment and qualified operators for:
  - Construction to manage water run-on and run off
  - Construction of facility to catch run off (to prevent it directly entering a watercourse)
  - Build and load compost windrow
  - Transport organic material on site
  - Transport birds to windrow location
- Optional
  - Liner material eg 200+ micron plastic sheet to go on the ground below the windrow
  - Open weave fabric eg shade cloth to cover windrow – used to restrict access to windrow of free flying birds, and assists in reducing effects of wind and rain.

#### 4. Warnings

- Where AI is known/likely to be present, all health and safety requirements must be in place.
- Plant & equipment operation – all personnel on site (other than the qualified operators) must be accounted for and in zones not used by the machinery. Personnel moving around the site must be clearly visible (eg reflective vests) and have separate paths to the machinery.
- In addition to the PPE as per Personal Decon SOP, the minimum PPE worn should be as for a construction site eg solid footwear with non slip sole, hard hat (subject to clearance), reflective vest, sun protection, +/- ear/eye protection as needed.
- It is essential a person skilled in the operation of plant and supporting infrastructure and utilities is on-site to coordinate and control activities.
- Only qualified personnel are to undertake tasks requiring tradesmen eg connection of utilities and operation of plant.
- Every effort should be taken to identify and reduce the presence of work place hazards including:
  - Features that may lead to slips, trips & falls eg uneven or wet ground
  - Clearance in sheds
  - Exposure to disinfectants being used (mixing & application)
  - Overlap between pedestrian, vehicle and plant traffic
  - Poor hygiene (dining, toilets & showers)
  - Hazards associated with catering ops (hygiene, kitchen hazards)
  - Open pits or similar
  - Poor electrical installations
  - Poor communication around the worksite
  - Sharp edges, corners etc on fences, buildings, steps
  - Fuel storage & handling
  - Adverse environmental effects
  - Poor manual handling techniques
  - Excessive odour from decomposing birds
  - Stress related to dealing with dead birds
  - Inadequate lighting or operations during night time
  - Vehicle movements
- Safety Advisor should routinely undertake risk assessments as part of audit processes.

- Rest Breaks - The staff will need to be managed so they have adequate rest breaks, etc.
- Site selection should be made to avoid public distress, reduce disease risks and protect property and water resources
- Electrical hazards outside may be underground and also overhead. Similar care should be taken in regard to other services such as gas, water, sewerage and communications.
- Use of an inappropriate organic material (ie too wet, too fine or too coarse) will lead to leachate leaking from the windrows, insufficient heat production and/or retention slowing composting, excessive odour, excessive insect infestations, compaction of windrows, reduced oxygen flow and insufficient temperatures for pathogen destruction.

## 5. Procedure

### 5.1 Preparation

- Collect information on;
  - Age and weight of birds
  - Available organic material in shed/on farm
  - Litter volume, structure, moisture etc
  - Shed details (eg clearance inside) if procedure carried out inside
  - Available plant and operators on site
  - Dimensions of proposed composting area to determine length and number of windrows
- Develop plan of operation – including Risk Assessments and site map
- In shed
  - Empty and raise/remove all feed and water lines, and other shed installations if possible.
  - Make safe all electrical installations and similar hazards.
  - Where in-shed litter is used, consideration should be given to the need to rip any “caked” litter prior to composting
- Site selection (in open) requires protection of water resources, property, public view and reduction of disease risk, requiring a site that is:
  - Accessible by large trucks for organic material and carcass delivery
  - Well drained location not subject to runoff or pooled water, and outside the 100 year floodplains or wetlands
  - At least 200m from homes, public roads, or other areas frequented by the public (where possible)
  - At least 60m from water sources (eg wells, streams) or visible bed rock outcrops
  - Away from timbered areas or buildings that could harbour rodents and burrowing predators.
- Consideration to be given to bunding the area to arrest potential run-off and run-on to the area

### 5.2 Construction – windrow width and height

- Construct windrow with layers of organic matter and carcasses
  - Minimum of approx 300mm deep of organic material as base
  - Alternate single layers (each about 200-300mm for larger birds) of dead birds separated by 150 to 300mm of organic material
  - A 300mm deep final layer of organic material covering the final layer of birds.
- Complete windrow should be approximately 4-5m wide and no more than 1.5 to 1.8m high. All birds should be no closer than 300mm to the outer edge of the windrow.
- Construction of layers will require careful operation of the plant.

- At the start of the process the moisture content should be approximately of 40-60% and pH around 6.

#### NOTE

A. No part of the birds should be exposed when the windrow is complete.

B. Where there is concern about pathogens on the outside of the windrow such as would be the case where used litter is part of the windrow, either

- Cover the windrow with approximately 200-250mm of clean organic material, or
- Spray with organic disinfectant to dampen but not wet to prevent outer layer to reduce dust dispersal.

### 5.3 Management of composting process

- Dataloggers
  - Insert a minimum of 1 datalogger in every windrow between the base and the first layer of carcasses along the centre line.
  - It is preferable to have 3 dataloggers – 1 in the middle and 1 at both ends.
  - Ensure the locations are clearly marked.
  - Use of a conduit is recommended.
  - Dataloggers should be checked at regular intervals.
- Monitor temperature
  - The ideal compost temperature is between 57C and 63C.
  - Typically the compost temperature will be approximately 55C in about 5-9 days and climb to around 70C in about 10-14 days (AI is killed at 60C for 10 minutes or 56C for 15-20mins).
- If the temperature does not reach the required level, contact the LDCC.
- The compost can be mixed at around 14 days preferably after the temperatures have been adequate to destroy the infective agent. Mixing will cause the temperature to rise and again fall and will involve use of plant turning the full windrow over. When mixing is used, the final outer layer should be again treated as for the original layer.
- Composting is considered complete when:
  - Temperature has reached the required level for the necessary time to kill the target pathogen, and
  - Breakdown of carcasses is 80-90% complete, ie no soft tissues (approximately 6 weeks for birds\_
- Manage pests by baiting, fencing, trapping, covering or other means as deemed necessary. Close shed in regard to pest entry.
- Restrict access to windrow area - lock shed, erect signs and construct temporary fencing (if necessary)
- The construction etc for the windrow in the open is largely as for inside a shed. The additional actions will be:
  - Construction of run-on and run-off to holding areas
  - Potential covering, and
  - Mixing can be done by moving the windrow from one area to another.

- Apply organic material to cover carcasses that may be exposed due to windrow collapse, adverse weather, or predator/pest interference. Organic material may also be used to soak up visible leachate from carcasses.

NOTE: Topsoil under windrows may accumulate salts or other phytotoxic materials that may suppress crop/pasture growth. Tillage of these soils may break up the affected layer which can then be mixed with uncontaminated soil.

## **6. References**

Ausvetplan manual for relevant disease

## **7. Appendices**