

# ALBERTA SHEEP

## Composting Dead Sheep and Lambs

Since rendering plants in western Canada quit accepting sheep in 1996, properly disposing of mortalities has become increasingly difficult. Due to the lack of disposal alternatives, a research project was started at the Lethbridge Research Centre in 1996 in order to investigate composting as a year-round method of dead sheep disposal. Composting is nothing new, but mortality composting has only recently been examined from a scientific perspective. The rate and success of the composting process is dependent on reaching a balance between carbon and nitrogen sources, water and oxygen. Mortality composting involves layering the dead animals within a medium that is high in carbon such as sawdust, chopped straw, chopped corn stover or mixtures of manure, straw and sawdust. A controlled amount of water is then added and the pile heats due to the activity of aerobic bacteria.

### Steps for Successful Year-Round Composting of Sheep Mortalities

#### 1. Estimate the Annual Number and Weight of Dead Sheep

Two compost bins (6 x 6 x 6 feet) can handle up to 500 pounds of dead lambs which if composted in the spring/summer will be finished in four or five months. The same two bins could be used for up to 2000 pounds of dead mature sheep in the winter, but will take at least 18 months to complete. A front-end-loader or Bobcat is desirable for moving/turning the compost from the primary into the secondary bin and bins should be sized to allow entry of the front-end-loader.

#### 2. Choose the Proper Location for the Composting Bins

Keep them at least 100 feet from water sources, 25 feet from coulees and your property line and 100 feet from residences. A south-facing area will help speed the rate of composting. The bins need to be fenced to prevent predators from gaining access.

#### 3. Construct the Bins

Bins can be wooden or made of big round straw bales. Air flow into the compost is important, so the base of the pile should be made of wooden packing pallets to allow air inflow. The top of the bin should also allow air inflow, but prevent entry of rain or snow. If the compost becomes too wet, anaerobic bacteria begin to flourish and the dead sheep will begin to produce objectionable odours. A wooden cap and tarp for an individual bin or a raised tarp to cover all bins is necessary.

#### 4. Build the Layers of Compost

The important ratio to remember is 2:1:1 (manure:chopped straw:dead sheep). This ratio is based on the weight of the ingredients of the compost. A simple way to keep this ratio is to measure the depth of the layers. Cover the bottom wooden pallets with seven inches of sheep manure. Next add seven inches of chopped barley straw. Lay



the dead sheep on the straw in a single layer, keeping the dead sheep at least six inches from the outside edge of the bin. After each dead sheep is laid on the straw, cover it with a thin layer of sheep manure. Once all dead sheep are in place, add another seven inches of manure on top of sheep and top with seven inches more chopped straw. If the bin is six feet high, it is possible to build another compost on top of the first.

## **5. Activate the Compost**

Water is needed to start the compost cooking. For our six foot composters we added 150 litres (35 gallons) of water. It is best to add the water before adding the top layer of chopped straw. The compost should be moist but not over wet. It is important to have a supply of manure protected from rain and snow. A layer of wet manure in the compost will keep the compost from heating properly (and release unpleasant odours when the pile is turned).

## **6. Check the Temperature**

A long stainless steel thermometer used to check grain bins for heating will work well for monitoring compost. Put the thermometer in the centre of the pile. The compost should reach at least 60°C within a week of adding the water (if composting in the summer) or within two weeks (if composting in the winter). Additional water may be needed when composting in the summer. If adding water does not cause an immediate increase in temperature, it is time to turn the compost into the secondary bin.

## **7. Turn the Compost**

Turning the compost is very important. Turning adds oxygen and mixes the compost to ensure complete decomposition of the dead sheep. If the compost was too wet in the primary bin, turning the compost into the secondary bin can save the day. Fill the front-end-loader bucket with the top layers of the bin. Raise the bucket as high as is safe and then drop the compost into the secondary bin. Check the temperature in the secondary bin after turning. Even in the winter, the temperature of the secondary bin should rise to 60°C within a week of turning.

## **8. What Is Left at the End of Composting?**

After the temperature of compost in the secondary bin falls to within a few degrees of the current outdoor temperature, the compost is essentially finished. All soft tissues should have disappeared and only a few bones from old ewes remain (lamb bones tend to disappear completely). Residual bones can be added to the next batches of compost and should become de-mineralized after a few passes through the compost bins. Wool should be completely degraded.

## **9. What about Scrapie and Other Disease-Causing Organisms?**

If Scrapie is suspected, composting should not be used. The Scrapie agent requires temperatures in excess of 200°C to be inactivated. Incineration is the **only** safe way to dispose of scrapie-infected sheep. Bacteria such as *E. coli* and *Salmonella* are destroyed by heating over 60°C and were not detected in the finished compost.

## **10. Other Considerations**

We found composting to be a successful method of year-round disposal of dead sheep and lambs. The length of time composting requires depends on the size/weight of animals composted and the

season of the year. Offensive odours are not a problem in well-managed compost. Provided that the compost is not over-wet, it should smell no worse than a manure pile.

A version of this paper *Composting Dead Sheep and Lambs* by K. Stanford<sup>1</sup>, F.J. Larney<sup>2</sup>, A.F. Olson<sup>2</sup> and L. J. Yanke<sup>2</sup> has been submitted to Compost Science and Utilization.

<sup>1</sup>Alberta Agriculture Food and Rural Development, Lethbridge, AB; <sup>2</sup>Agriculture and Agri-Food Canada, Lethbridge, AB.