

Economics

For areas of intense livestock operations, the composting of manure may be an economically viable venture.

Comparative costs of composting methods

Composting Method	Cost Per Ton of Manure (Before Composting)
Windrow composting using a loader for turning	\$5-\$10
Windrow composting using specialized windrow turners	\$15-\$30
Aerated static pile systems	\$20-\$50
In-Vessel systems	\$50-\$100

MacNeil and Sawyer, 1999

**Above cost in \$ US.

Additional expenses are often not included when determining composting costs. The producer is still required to clean pens and transport the manure. Such activities occur irrespective of composting and consequently, are considered sunk costs.

There exist a number of benefits provided by compost which cannot be readily described in terms of economic value. They are as follows:

- Improved soil tilth.
- Increased organic matter
- Gradual nutrient release
- Reduction in pollution of air and water

According to a Lethbridge study, as the distance to a spreading site increases, it becomes relatively more expensive to spread manure vs. compost. This is due to the weight and volume reduction of composted manure. For example, at a distance of approximately 13 km, the cost to haul 40 tonnes of compost, plus composting costs, equals the cost to haul 100 tonnes of manure. This is the break-even distance. A producer must haul further to make up for the added cost of composting manure.

Application

The viability of composting is often determined through the cost of application. Extra costs associated with composting (including application) are balanced by the weight and volume reduction of composted manure versus manure in its original form.

Commercial markets for compost also exist in the form of:

1. Greenhouses
2. Nursery Growers
3. Organic Farms

Unfortunately, composting is not a mainstay in Alberta agriculture. Our markets for compost remain undeveloped.

Based on "An Overview of the Social, Environmental, and Economic Aspects of Manure Management in Alberta's Livestock and Poultry Sectors"

University of Alberta

J. Unterschultz et al, 2000

Contact Wild Rose Agricultural Producers for more info.

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MANURE MANAGEMENT

A MANURE MANAGEMENT SERIES



**Benefits
Of Compost &
Processing**

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Processed Manure

The treatment of manure is important, for it maximizes nutrient value, reduces odor, and limits pollution potential. Generally, 3 different methods of manure treatment are utilized

Methods

1. Physical
 - Separation of solids and liquids through:
 - Sedimentation (\$)
 - Centrifugation(\$\$\$)
 - Screening (\$\$)
 - Pressing (\$\$\$)
 - Works well with liquid manure.
2. Chemical
 - Good for dealing with odor
 - Success is questionable
 - Can generate specific problems
 - May be expensive
3. Biological
 - Reduces odor production
 - Limits water pollution risk
 - Produces compost or bio-gas
 - Either anaerobic or aerobic (compost)

Anaerobic Treatment

There are two main methods of anaerobic (no oxygen present) treatment:

- Anaerobic lagoons

These are popular in warmer climates, and have low startup and usage costs. They do, however, release odors and ammonia. This type of treatment is generally effective in areas with limited cropland (for manure application).

- Anaerobic digesters

These can be used in the production of bio-gas. The methane produced from this operation can be used for heating or power generation. However, maintenance and very high initial costs limit the use of this method. In many areas this method is not economical.

Aerobic Treatment - Composting

This treatment is biologically motivated and has been popularized in composting. During composting, microorganisms convert organic wastes into a lighter material. This natural process can provide a useful method of managing manure. Composting is beneficial for a number of reasons:

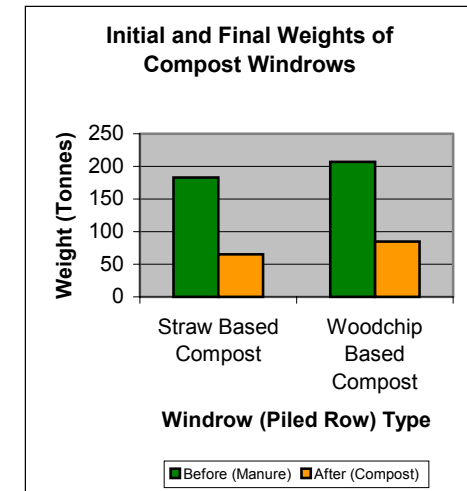
1. Few offensive odors produced
2. Reduction of manure volume
3. Lowers water content, and thus weight
4. Destruction of pathogens and weed seeds

Although there may be some nitrogen losses during the composting process, much of the nitrogen locks up in organic forms - thus greatly reducing leaching potential. Furthermore, the loss of weight while composting dramatically increases (concentrates) the nutrient value of the manure.

FACT: After 3 months of composting, volume of beef feedlot manure can be reduced up to 60%.

The following table is based on cattle manure.

Data from Freeze et al, 1999



Small Advantage

Small scale farming is well suited for manure composting. Modifications and costs are minimal. The use of aerated piles will often suffice. For larger more elaborate farming operations, more sophisticated equipment and methods are appropriate. Extensive windrowing (piled row) operations may be implemented.

Methods

Two alternative methods of composting exist.

1. In-Vessel-Composting

- Year round composting
- Complete destruction of seeds and pathogens
- High initial cost, but low operating cost

2. Vermi-composting

- Composting through use of worms
- Some market potential.