8.0 COMPOSTING MANURE

Some farm operators in Newfoundland and Labrador are composting manures as a means of returning nutrients back to the soil. Composting is a biological process in which micro-organisms aerobically convert organic materials into a soil-like material called compost. During composting, the microorganisms consume oxygen while feeding on the organic matter. They also generate heat and large quantities of carbon dioxide and water vapour. The rate at which manure will compost depends on:

- the moisture content;
- temperature;
- level of oxygen available;
- size of the manure particles; and,
- relative quantities of carbon and nitrogen available to the microorganisms for use as food.

The optimum solids content for composting is between 40% and 50%. It is, therefore, necessary to increase the solids content of liquid waste to at least 35% before it can be composted. Fresh manure can be screened and the resulting solids, which are about 35% moisture, are composted directly. The liquid portion is collected and goes to storage. It is also possible to add some form of bulking agent, such as straw or sawdust, to adjust the moisture content before beginning composting. During the composting process, the volume of waste will be reduced by up to 50%.

An adequate supply of oxygen is required throughout the pile. To achieve this, maintain the pile at 40 to 50 percent solids and mix the material on a regular basis. This process can be carried out using either a windrow system, aerated static piles or an in-vessel system. The windrow method consists of placing the mixture of raw materials in long narrow rows (typically 1.0 to 1.2 metres high and 3.0 to 3.6 metres wide [4 by 12 feet]). The windrows are then turned on a fixed schedule to increase aeration and to rebuild the bed porosity. Aerated static piles are aerated directly with forced air systems or passive systems where pipes are placed throughout the pile to speed up the process. The in-vessel system confines the composting material within a building or container and uses forced aeration and mechanical turning to speed up the composting process.

Windrow composting generally takes from one to four months depending on the frequency of turning. In-vessel composting or aerated static piles range from two to four weeks. When managed properly, the composting process is aerobic and the release of odours must be minimal - the product will have an earthy odour. If the conditions are not controlled and the manure begins to decompose anaerobically, the compost produces very strong offensive odours and the process can take much longer.

Prevent leachate to ground and surface water through proper site selection (soils, topography), diversion of run-off from surrounding areas, including a bed of peat as a base for compost and relocating compost piles each year to minimize the accumulation of nutrients.

So far, the markets for composted manure are limited and the costs of the composting may not be recoverable in the sale of the final product. Farm operators in central areas of the province are composting a mixture of manure with peat moss. Wood chips are used for composting in areas around St. John’s.