



## Recycling Technology Newsletter at CANMET-MMSL

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### ***Municipal Waste Diversion in Ontario***

*By Linda Varangu*

Over the past years we have seen a public awakening to the concerns of managing solid waste. With total waste quantities generated across the province of Ontario at around 10 000 000 tonnes per year, the diversion of some of this waste would be welcome. The public has been well served by local municipal waste diversion programs such as recycling programs, household hazardous waste programs, backyard composting programs, reuse centres, and education on less wasteful and toxic alternatives. Through these various programs, Ontario residents were able to divert an estimated 900 000 tonnes from landfills in 1994, with approximately 500 000 tonnes coming from the blue box program.

The blue box program has become an institution in households across Ontario. Many blue box programs now include materials such as textiles, different types of plastics, and household fine paper in addition to metal cans, glass bottles, newspaper, and plastic bottles. 3.2 million households in Ontario (or 85%), now have access to recycling programs. In various municipalities, pilot programs have demonstrated that householders can achieve solid waste diversion of over 75% using a combination of reduction, reuse, composting, and recycling. Considering that only a few years ago, even 50% diversion was considered unattainable, these diversion rates are remarkable.

Several years ago, federal and provincial governments set diversion goals of 50% by the year 2000. How likely is it that Ontario municipalities will achieve this? Not very. Lately, the diversion rate for municipalities has reached a plateau at 25-35%. Significant changes in waste diversion programs must be offered that include attention to the organic stream if we are to go beyond this plateau. Instead of expanding waste diversion programs, however, funding cuts may see the erosion of support for some programs currently offered by municipalities.

Many municipalities are now concentrating on activities that will enable them to run their programs as efficiently and cost effectively as possible. One of the key objectives is to keep recycling operations costs as low or lower than garbage collection costs. The strategy includes reducing operational costs and services, and increasing revenues from materials sold through recycling programs.

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### ***Composting***

*By Pierrette King*

COMPOSTING is an effective recycling strategy for turning otherwise unrecyclable organic wastes into a valuable resource. It is estimated that approximately 40 to 70 percent of the total municipal solid waste stream could be composted. Some examples of organic material that can be composted include fruit and vegetable scraps, tea bags and coffee grounds, leaves and yard wastes, agricultural crop residues, paper products, sewage sludge, and wood.

Composting is a natural biological decomposition process by which microorganisms (primarily bacteria) break down organic material. There are two types of composting processes (performed by different types of bacteria): aerobic and anaerobic. Aerobic composting requires oxygen, while anaerobic composting takes place in an oxygen-depleted environment. The by-products of anaerobic composting include volatile amines (which smell like rotten fish), hydrogen sulphide (which smells like rotten eggs), and methane. The anaerobic process is not recommended for backyard composting.

In addition to oxygen, aerobic microbial activity requires food (carbon for energy and nitrogen for protein building), and adequate moisture and temperature. During the aerobic composting process, bacteria break down the organic waste, and the pile gives off heat. The compost temperature should not be allowed to exceed 70°C, because most

microorganisms involved in composting die or become inactive above this temperature. When the compost no longer generates heat, it is generally ready to be used.

Composting is, of course, not a new idea, but centralized composting facilities have only recently appeared in government, institutions, and various rural settings. There are presently 162 composting facilities in Canada, of which 112 are municipal and 50 are private. These facilities processed almost 700 000 tonnes of organic waste in 1994. There are three basic types of centralized aerobic composting methods:

- the windrow method consisting of long triangular rows known as windrows, which are turned mechanically;
- the aerated static pile method, which involves forming windrows over perforated pipes, and supplying air to the micro-organisms through the pipes rather than turning the compost; and
- the in-vessel method, where the organic material is composted inside a drum, silo, agitated bed, covered or open channels, batch container, or other structure. The process conditions are closely monitored and controlled. The material is aerated and mechanically turned or agitated.

Standardized testing methods are needed that would certify the maturity and stability of different compost batches. The quality of compost is largely defined by its intended use. High quality compost is used in agriculture, horticulture, landscaping, and home gardening. Medium and low quality compost is used in erosion control, roadside landscaping, as a landfill cover, and in land reclamation projects.