COMPOSTING

Ray Ayer
Solid Waste Department
Ann Arbor, MI

ANN ARBOR COMPOSTING PROGRAM

The City of Ann Arbor has been collecting leaves and composting them for over 15 years. In 1990 the Solid Waste Department started its separate yard waste collection program for co-mingled grass, leaves, and brush. This material is processed at the Ann Arbor Composting Center. The City processes approximately 60,000 cubic yards of material each year. This includes about 22,000 cubic yards of yard waste collected from residences, 28,000 cubic yards of leaves collected from the streets, and about 10,000 cubic yards of brush and yard waste dropped off at the Compost Center.

The Compost Processing Center cost approximately $1,250,000 to develop including site development, engineering and equipment and has an annual operating budget of approximately $300,000. The cost to process yard waste into finished compost is approximately $5.00 per cubic yard. The yard waste collection program runs about $300,000 a year for about 22,000 cy of yard waste with collection cost of about $13.60 per cubic yard.

Yard waste is collected on a weekly basis from the 20,000 homes between April 1st and November 30th. This is done on the same day as refuse and recycling collection. Yard waste is defined as grass, brush, vegetive material, wood debris under six inches in diameter, garden waste, yard waste, Christmas trees and wreaths. The material is collected using 4-5 side-load compacting refuse trucks with a compacted volume of eighteen cubic yards. These trucks are used daily only for collecting yard waste. Brush and yard waste is also dropped off at the compost center year round and Christmas trees are collected in January.

All material collected or dropped off at the center is run through a large tub grinder manufactured by Morbark Industries. The material comes off a conveyor belt into pump trucks that put them into windrows. Each windrow is approximately 12' wide by 300'-500' long. The material in each windrow is turned each week with a Scarab windrow turner. After about twelve weeks of processing and a 50% reduction in size, the material is screened through a large Fuel Harvesters Trommel Screen. The trommel screen removes uncomposted material, golf balls, large over-sized sticks, and other debris. The resulting compost is used internally for City projects, for placement in the parks, and for planting trees and bulbs along the downtown streets.

Leaves and brush are blended in with the grass to obtain an approximately 30 parts carbon to 1 part nitrogen mixture. This mixture with frequent turning of the windrows allows the site to be operated with no offensive off site odors. In 1992 the City ceased collecting yard waste in plastic bags as it found grass in plastic bags had already turned anaerobic by the time they collected it and it was very difficult to control the incoming odors. Yard waste is only collected in trash cans or thirty gallon paper bags. Thirty gallon paper bags are available in almost every hardware, grocery and drug store in town and work extremely well for yard waste.

The goal of the City of Ann Arbor Yard Waste/Composting Program has been to reduce the volume of material being landfilled, to save money by composting it instead of landfilling it, to produce a quality finished product in a cost efficient manner without producing odors. Since the City has its own collection crews and its own processing crews, it has very close control on the quality and the removal of plastic bags has reduced the incoming odors resulting in a quality finished product with no adverse environmental problems.

The local tipping fee is $9.00 per cubic yard for landfilling plus a fifty mile round trip. Processing at $5.00 a cubic yard and avoiding several hours of transportation costs have significantly cut overall operating costs for the Solid Waste Department and the City and have resulted in a quality finished product that is desired both by internal City departments and the public. Questions on the program may be directed to Ray S. Ayer, Composting Manager (313) 994–2807.

ANN ARBOR COMPOST OPERATIONS

Daily Operations

1. Yard waste is brought in and deposited in front of tub grinder.
2. All trash and debris is removed.
3. Check for odors and take actions to alleviate cause of odors
4. Yard waste is to be ground up and placed in windrows within 24 hours. of receiving it, and all yard waste to be processed and put in windrows by closing time on friday. No unprocessed yard waste is to be left over the weekend, other than brush.
5. Drainage will be maintained to alleviate any standing water
6. Leaves or other material will be added to windrows to maintain "30 to 1" carbon to nitrogen mixture. (two parts leaves to 1 part grass).
7. Windows checked for trash & debris.
8. Blowing material to be cleaned up.
9. Equipment to be checked and lubricated as per specifications, hour meters to be read
10. Daily reports to be filled out.
11. Water and maintain flowers.
12. Individual windrows are to be labeled for record keeping.
13. Do dust control activities as needed.

Weekly Operations

1. Window temperature and moisture will be monitored and noted tuesday and thursday.
2. Windows will be turned when they reach 140 degrees or at least weekly.
3. Pad will be maintained to provide drainage and access.
4. General clean up of area.
5. Empty trash containers.
6. Clean equipment.
7. Windrows are to be watered to maintain 60% moisture.
8. Staff meeting with compost manager.
9. Roads and signs maintained.
10. Tub grinder hammers will be hardfaced.
11. Leaves hauled in from other sites.
12. Windows mixed with other windrows as they reduce in size.

Monthly Operations

1. Leaf windrows at other locations to be turned.
2. Grinding of brush and wood waste that has been dropped off.

3. Hauling of woodchips/ compost.
4. Tub grinder hammers will be changed, windrow turner flails to be checked and reversed.
5. Site tours.

GRASS COMPOSTING PRINCIPALS

1. Keep proper carbon/nitrogen ratio.
2. Provide aeration to keep material aerobic.
3. Provide 60% moisture.
4. Provide and maintain bacterial populations.

Conditions

1. Grass is very high in nitrogen and will give off ammonia gas and other smells like silage if not fixed with carbon. 30 parts carbon to 1 part nitrogen (30/1 ration). This translates out to about 2 parts leaves to 1 part grass. If leaves are not available cornstalks, sawdust, straw, dead weeds or other high carbon materials must be used. Grass alone cannot be successfully composted without having a slimy stinky mess.

CARBON TO NITROGEN RATIOS

grass clippings	20:1
green leaves	40:1
dry leaves	80:1
sawdust/wood chips	500:1
dry straw	100:1
cow manure	20:1

2. If the material is not turned and mixed it will go anaerobic and smell bad. The entire pile must be mixed and turned once or twice a week. Leaves alone may be turned 3--5 times per year. The site must allow equipment to turn the material under varying weather conditions.

3. Material should be damp but not wet. This allows maximum bacterial action to break down the material. In the spring the material may stay wet enough, but if it gets too wet it drives out the oxygen and it will go anaerobic. In the summer it may dry out and slow down the bacterial break down process. Water must be added to the center of the pile. The material may be turned during a rain storm if conditions allow.

4. The bacteria to digest anything is already on that thing. Thus the natural bacteria are already present, however conditions must be maintained to allow them to thrive and multiply. "Starters" are not normally needed although soil or manure may be added to give it a boost.

The above requires the application of the M & Ms principal. Money, manpower, & motivation, none of the above will happen if the program is squeezed in between other duties. A person must be put in charge with adequate time, management support and money.