

COMPOSTING LANDSCAPE WASTE¹

by Rodney A. Fletcher

In the fall of 1985, our Yard Waste Reclamation Site was established to divert landscape waste from the Urbana, Illinois landfill. It has been our experience that significant portions of the waste stream can be diverted to a facility of this type and yard waste materials can be recycled into useable products. Three basic operations are conducted at this reclamation facility: 1) grinding brush eight inches or less in diameter, 2) composting of leaves and grass, and 3) cutting and splitting bulk wood (larger than eight inches in diameter) into firewood.

The site primarily serves the urbanized area of Urbana/Champaign (population 125,000); however, the site is available to all Champaign County residents. A schedule of volumes that have been received at the site since September of 1985 are found in Table 1. Gate volumes both loose and compacted have ranged from 20,000 to 27,000 cubic yards received. It has been our experience that approximately 50 percent of this volume is comprised of brush, with the remainder being leaves and grass. It is estimated that up to 60,000 cubic yards of material can be processed annually.

The site is in operation from 8:00 a.m. to 3:30 p.m. (Monday through Saturday) except for holidays throughout the year. During these times, the site will be open to receive yard waste materials for processing and will also disperse processed materials to the general public and private companies.

General Management

Material that arrives on site is assessed a tipping fee based on estimated yardage. A ticket is then issued which records the type of material, i.e., brush, leaves or grass, and corresponding volumes. These tickets will be used not only to account for types and amounts of incoming materials, but also distributed material. In addition, the following information will also be maintained at the facility: 1) the date when the first and last load

of material is placed in each windrow, and 2) the date associated with the completed windrow while they "cure". Drivers are then instructed to deposit material at the appropriate processing location. Every effort is made to ensure that the loads are "clean" and free of unwanted debris; however, unwanted debris that is found is disposed of in a 20-yard container which is then taken to an appropriate landfill facility. Dust is controlled by periodic watering. Due to the site's remote location, noise has not posed any problems in the operation; however, all equipment is equipped with mufflers and employees wear appropriate protective devices.

The brush grinding operation comprises 1.4 acres. Grinding of brush eight inches or less in diameter is accomplished utilizing a W.H.O. tub grinder. Brush and/or bulk wood dumped in this area that is larger than eight inches is pulled out by on-site personnel and stored in the bulk wood storage areas. Grinding is performed on an as-needed basis, depending on the quantities of materials received. If for some reason, the accumulation of brush exceeds that which can be stockpiled at the grinding area, then it is diverted to the brush overflow area. The quantity of brush that we have historically received requires the grinder to operate approximately 300 hours per year.

Wood that is received at the site which cannot be processed by the grinding operation is deposited in the bulk wood storage area which comprises 2.65 acres. This area has the capacity to store approximately 6,250 cubic yards of bulk wood.

Some quantities of bulk wood are cut and split into firewood by on-site personnel and then sold to the general public in accordance with the rules and regulations of the site. Additionally, some non-split wood is available at no charge to the general public or private business for use as firewood. Efforts are being considered to secure a

1. Presented at the annual conference of the International Society of Arboriculture in Philadelphia in August of 1991.

commercial company who would, under contractual arrangement, utilize excess volumes of bulk wood. If this cannot be accomplished then the remaining option would be to contract with a company to grind material that would accumulate in excess of public demand.

Composting

Leaves and grass that are received at the site are composted using a windrow method. Most of the leaves and grass received are already debagged and are deposited directly into the windrow; however, some materials are received in degradable plastic bags. Processing techniques for the degradable plastics will be addressed later. Composting Area #1, which comprises approximately 3.18 acres, has historically been able to compost approximately 10,000 to 15,000 cubic yards of material annually. As material arrives on site, it is formed initially into windrows approximately 12 to 14 feet in width and approximately 8 feet in height. This is accomplished with either our agricultural tractor with a bucket attachment or the crawler loader. Windrows are established to lengths and widths within the designated areas which will allow adequate turning and maneuvering of equipment. In the compost areas the windrows are 350 to 400 feet in length and are spaced approximately 24 feet on center. This allows for a lane

approximately 12 feet in width between each windrow. All windrows are lined parallel to the grade existing to allow for adequate drainage of precipitation. The only pre-treatment undertaken for debagged material received for composting is to remove unwanted debris such as glass, bottles, or metal cans. This is done to keep material as clean as possible; however, this is a difficult task and can be more effectively accomplished with screening material in post processing.

A wildcat compost turner is utilized to aerate the windrows. The windrows are turned approximately once a month. Natural precipitation has been the only source of water used in the composting process at this site. Under this particular management process, a stabilized compost product is available for use within 6 to 7 months after being received on site.

Grass that is received during the summer months is deposited directly onto existing windrows of leaves. The leaves then act as a bulking agent for the grass to be composted. The leaf windrows that receive grass then are turned approximately once a week so as to reduce anaerobic odors generated from the grass. Odors that are generated as a result of the composting process are dispersed relatively quickly and have posed no difficulties.

Completed composting can be determined in several different ways. Temperature of a com-

Table 1. Received volumes at the yard waste site collected by month and by fiscal year.

Month	FY85/86	FY86/87	FY87/88	FY88/89	FY89/90	FY90/91
July		1844	3252	164	1415	2827
August		2114	2601	1555	1479	2894
September	1616	1388	2996	1181	1413	2169
October	3503	1946	2792	1418	2500	2518
November	2549	3885	6671	5328	4223	5565
December	908	2289	957	1747	968	1344
January	958	299	1087	1154	860	449
February	381	1093	565	574	390	356
March	1292	1186	1360	914	0	835
April	1704	1645	2273	1623	1700	2147
May	2186	1991	2255	1785	2369	2722
June	1921	2442	2393	2044	2489	3211
Total	17018	22133	28308	20964	19806	27037

Table 2. 1989 Operational costs in dollars per cubic yard.

	Capital	O& M*	Labor	Misc	Subtotal
Preprocessing	1.89	2.77	2.01	.58	7.25
Composting	1.04	.85	1.46	.42	3.77
Grinding alone	1.43	2.29	2.01	.58	6.31

*O&M = Operation & Maintenance

pleted pile can be taken in the windrow core and, if temperatures are below 35° C, the composting process is usually considered complete. However, these temperatures will vary and other observations can be made to assist in this determination. Finished compost should have a humus-like texture and no foreign odors should be associated with it.

Degradable plastics have successfully been used in the collection of yard wastes and have met limited success in composting. The composting process utilizing these types of bags requires more processing techniques than the material that arrives debagged. Several management techniques are being implemented at this site to obtain a preferred methodology and to achieve sufficient degradation of plastics so the compost may be used as a soil amendment. These management practices include pre-processing techniques such as grinding the bags with their contents in a tub grinder, utilizing an agricultural disk for cutting the bags into smaller pieces and then forming them into windrows. By reducing the size of the bags, either by grinding or cutting, more edges are then exposed for the biodegradation process. If net end uses of compost can tolerate residual plastic fragments, then degradable plastic

may be a viable alternative primarily due to their low acquisition costs. However, kraft paper bags readily degrade and contribute to the quality of the finished product: its only drawback is higher acquisition costs.

Once the composting process is completed, the finished product is stockpiled in a large windrow. This particular windrow is located along a service road which enables loading of material to commercial users. Distribution stockpiles are located near the gate house where small stockpiles of finished compost and woodchips and firewood are available to residential users. Users who wish to purchase large quantities of woodchips are loaded from the woodchips stockpile located near the brush grinding area.

All processed materials are made available to both public and private concerns in accordance with published rules and regulations. Operational costs are presented in Table 2. A market development is underway to secure additional users for the processed materials.

*Environmental Manager
Urbana Public Works
706 South Glover
Urbana, Illinois 61801*