

B BROWN BEAR

COMPOSTING OF RESIDENTIAL YARD WASTES

Yardwaste problems . . .

Take a small community with highly favorable plant-growing conditions. Its residents rightfully boast of lovely lawns and gardens; they routinely self-dispose of the heavy volumes of leaves, grass and brush clippings which result. Suddenly, they have the most-common handling methods banned. New state laws eliminate both burning and land-filling of yard wastes. What do they — and the city's administration — do now with all that waste greenery. Can you transform it into something worthwhile? If so, what's the best method? How do you recover your capital costs? Your operating costs? How do you get homeowners to cooperate with your program?

These were the questions facing Maryville (population 10,663) when the Missouri State Legislature adopted Senate Bill 530 and Subtitle D.

. . . Solved efficiently

By definition, the new codes defined the newly-banned wastes as "leaves, grass clippings, yard and garden vegetation, and Christmas trees". Only stumps, tree roots and shrubs with intact root balls could be landfilled and then only until new reduction methods could be tested and guidelines approved.

Initially, to meet the new requirements, Maryville city officials directed residents to bring their affected yard wastes to a



Initial Composting Pass.

community-owned farm. Serious problems immediately surfaced.

Because the site was difficult to guard, people dumped such non-biodegradables as appliances, tires and furniture along with their greenery. Additionally, materials which might be expected to decompose did so only by chance.

City management quickly changed things.

Their target became the production of a useful product — compost. A city team applied to the state for financial startup help. The Missouri Department of Natural Resources granted \$80,000. Maryville's city council allotted 25% of that sum, as specified by MDNR guidelines. The total \$100,000

purchased what the city considered the necessary ingredients for the small operation its Solid Waste Department felt would do the job effectively: a graded fenced site, incoming inspection and the simplest of material-handling equipment — an industrial tractor (a new 102 hp bidirectional Ford Model 9030) with 1 1/2 yard loader bucket and (from Brown Bear Corporation, Corning, Iowa) a new interchangeable 36" x 144" powered auger-aerator. Grant money also covered one year's wages for the tractor operator.

These components, summarized the city's investigating team, would assure natural decomposition.

For control of incoming material, Solid Waste moved the



Windrow displaced to ground level.

receiving/composting location to a 3/4 acre portion of the city's sanitary landfill. High, well-drained, never used for refuse disposal, this property was already fenced so security could be (and was) easily established. Its location on U.S. Highway 71, only 3 miles from Maryville's courthouse square, made its services convenient for both residents and businesses.

Simple procedure

Today, the site receives yard wastes not only from the city's homeowners, but also those living in its county, Nodaway, and four others that make up the northwestern corner of Missouri: Atchison, Worth, Holt and Gentry.

Municipal vehicles, 10 private waste collection contractors, and a substantial number of the 43,200 people who live in the service area bring their cuttings and leaves to the site in bulk and bags. Placement is made as directed by the landfill's scalehouse attendant.

Including daily deliveries and single spring and fall cleanup days, incoming green volume averages 10 tons per month.

Some months, volumes of 45 to 55 tons have been recorded.

All green matter turns into removable compost. "There is no waste in this operation," emphasizes Greg Decker, Maryville's solid waste department superintendent.

All incoming loads are weighed at the landfill gatehouse, even those as small as 5 or 10 pounds. Garbage, metal and other items which do not comply with posted regulations are not allowed — most haulers take them next door to the landfill. Plastic bags must be emptied and removed; these materials are not allowed in the composting area since they, too, do not decompose.

The green wastes which pass inspection are hand-dumped in the well-marked, identified space. Vehicle access to all sites is easy — composting and landfill unloading areas are kept level and graded; transportation to and between them is over department-maintained, gravel-topped, all weather roadways.

Spreading and leveling, of the deposited greenery can be accomplished by either loader bucket or auger.

Superintendent Decker identifies the Brown Bear aerator as "the key to operational success".

Chosen after much study and observation, this front-mounted tractor attachment turns and mixes the green wastes "far more effectively than could a bucket or other device," Decker explains. The Brown Bear, he notes, floats along the contours of the ground, minimizing the inclusion of dirt in the mix, reducing drag and, except for turns, working the material non-stop.

Composting usually takes place through four or five windrows of green wastes, each about 100 feet long, 5 feet high and 4 feet wide.

Nothing added

Solid Waste Department personnel have found through experience that, with Brown Bear mixing/aerating, nothing else has to be done with the material to accomplish efficient and thorough reduction. Nothing is added, neither bulking agents, nor water, nor chemicals. Nothing is mechanically ground — the augering action itself pulverizes leaves, twigs and small cuttings. Nothing is screened — the pre-unloading visual inspections have proved sufficient to virtually eliminate metal, plastics and other non-biodegradable substances.



Paddle reduces particle size.

Operations are equally simple. One man handles the entire composting job in an average of only 1 1/2 days per week.

On the other 3 1/2 days, he operates the city's landfill dozer, compactor and/or self-elevating scraper.

Tractor bucket/aerator interchange takes little time and no effort. The machine's operator, working alone, detaches one unit, then maneuvers the tractor to the other. A quick snap re-locks the machine's standard three-point hitch into the proper connections. In a few minutes, the machine is back in action.

As an auger-aerator, the tool mixes and turns decomposing vegetation in a 12 foot swath, 3 feet high, with a turning speed of 240 rpm. With forward vehicle speeds maintained at 2 to 3 miles per hour (176 to 264 feet per minute), the entire on-site green mass is rolled in less than half an hour.

Once a week, a simple 4-foot-long probe-type thermometer comes into action. Hand-pushed at random into the windrows, it registers material temperatures. Interior readings of 120°F or more trigger another complete turning cycle. Usually, work intervals average once a week, though

operators Lloyd Wood and Dan Bozarth recall times when mixing has been done as often as once a day. This process keeps the mass at optimum temperatures, adds oxygen and destroys flies, maggots and other insects. With anaerobic conditions virtually eliminated, noxious odors rarely materialize. "Temperatures naturally stay within a range which leads to desired processing," notes Wood. "Even in the middle of our Missouri winters, windrow readings rarely go below 90°F."

Success

Brown Bear auger-aeration of this frequency, by itself, accomplishes the desired composting. "Generally within about three months, the recognizable features of leaves, brush and grass have disappeared," Supt. Decker explains. "In their place is a fine, homogenous, black material which looks, smells and acts like fresh, rich, black dirt."

The finished product is stockpiled by the tractor and bucket.

Generally, the same people who furnished the raw yard wastes take the compost away. Residents and businesses do their own loading of the cured material and, at home, their own unloading and application to lawns,

gardens, shrubs and tree plantings. Tests show the material conditions and enhances in-place solids. Water retention capacities are increased; nitrogen and other nutrients added.

Public Relation activities

Before composting operations began in 1996, city management recognized that public understanding and cooperation would be critical to success of their operation.

City staff members, in conjunction with representatives from the Northwest Missouri Regional Council of Governments, started their public relations campaign by developing an explanatory brochure. Its text emphasized the values of composting and recycling, hours of the city's operation, where, how and why. A separate grant of \$5,000 from the state's Regional Solid Waste District paid for printing and distributing 25,000 copies throughout Maryville and the five participating counties. The message was repeated by radio and newspaper ads, and by presentations to schools and civic groups. Everyone was told the service required only their participation. No separate charges were to be made. "We found results improve measurably wherever we told people the composting program was



Blending a mix of old and new.

free,” says David Angerer, city manager.

“Only in its first month or so did we need to watch yard waste deliveries closely,” says Matthew Chesnut, assistant city manager and director of public works. “After that — and still today, five years later — we find we have educated our constituency as to the materials which can be composted and to the values of the compost they can have.

“Every load is inspected at the landfill’s scalehouse. Unsuitable materials, directed to landfill areas nearby, draw a disposal fee based on material weight — currently \$61 per ton, with a \$13 minimum for up to 425 pounds. All green wastes, no matter their weight or yardage, go at no charge to the composting area.”

Low cost

Despite drawing no fee income, the entire compost production/stockpiling/loadout program requires very little expense. Maryville’s current city budget earmarks an operating cost of less than \$4,000 per year, a total which covers fuel, lubricants, scheduled maintenance and

replacements, and unscheduled repairs.

Expenses for the item, “unscheduled repairs”, have been minimal.

In five years — 60 months, to date — of year-round operation, the aerator-auger attachment has never been shut down by an emergency.

Operator costs are covered by the landfill budget. Work there takes up about 70% of the tractor operators’ time.

High recognition

“Lots of professional engineers and city management people who have visited our operation over the past years have been amazed at its low-cost simplicity and high-level effectiveness,” states Decker.

“Other communities, with our permission and to their success, have copied our state grant, public relation and operational procedures.

“We — and they — note that the Brown Bear auger is key to program effectiveness. You can tell just from looking at our finished-product stockpiles that the unit mixes materials most effectively. No other type of machine that we know of does the job as well.

“The auger alone provides a complete composting service, turning yard wastes into a valuable soil additive, without costing much money, operating or management time.

“Not even bad weather stops it for long. Whenever we have a lot of rain, we simply wait until our composting area dries for mixing to resume. Out-time has never been more than two or three days.

“We get lots of compliments about what our compost has done to improve home and business landscaping, lawns and gardens — and virtually no complaints about odors or anything else.

“About the only critical remark we ever hear is that a few people think we should be open 24 hours a day 7 days a week. Most, however, find our 12-hour 5 1/2-day schedule just fine.

“If we had it to do over again, we’d compost in exactly the same way.

“As we tell everyone, we have no plans to change anything.

“We feel we and our tractor-mounted Brown Bear auger-aerator have solved our yard waste problems in a manner appreciated by our constituency, our neighbors, and our state.”

Three Brown stripes . . . the sign of quality

