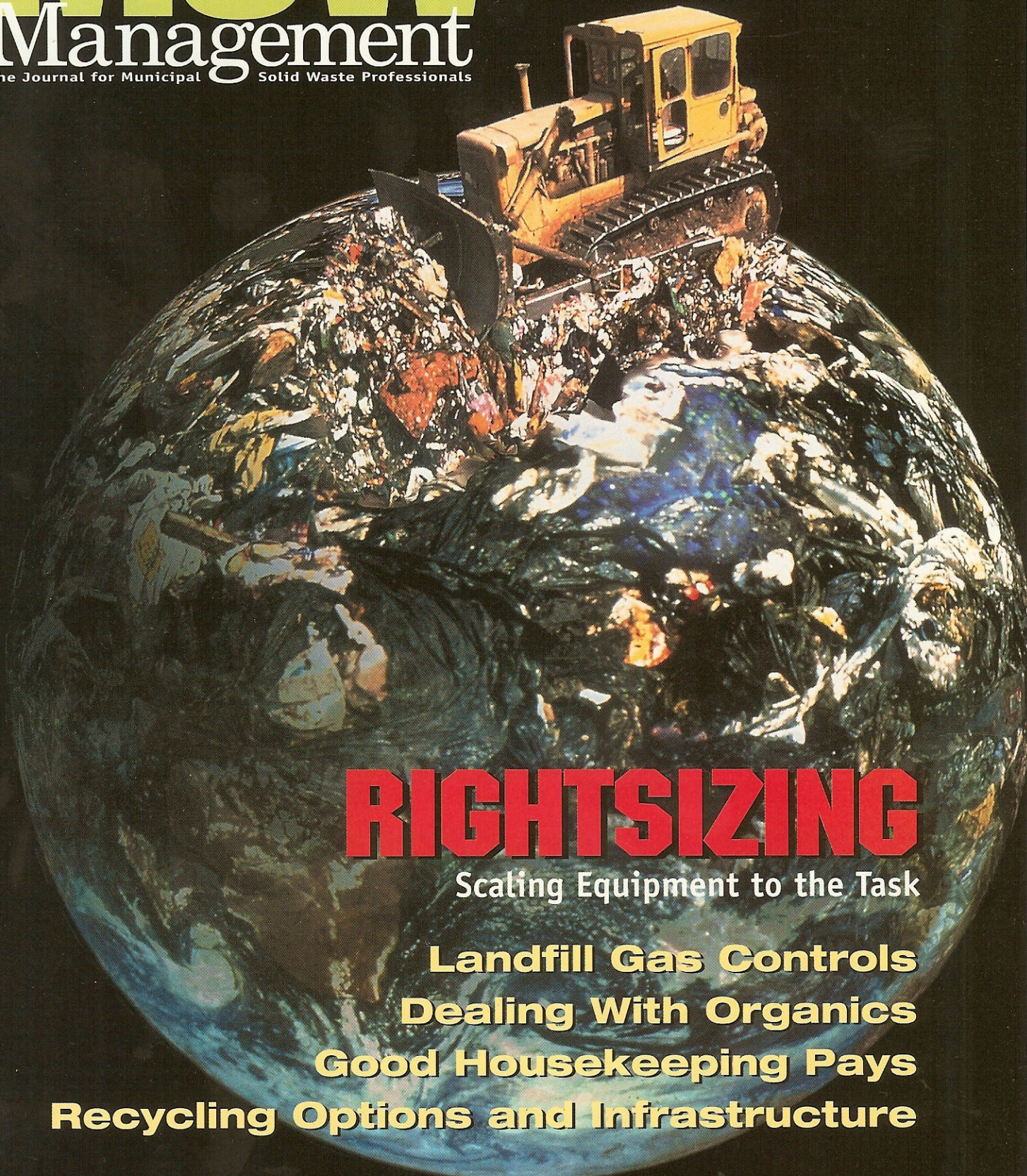


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Management

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Making the Blue Bag Green

Many MSW managers have opted for "blue bag"-type systems to facilitate collection of source-separated yardwastes in easily identified bags for their composting programs. These bags, if made of conventional plastic, can present a serious problem to the compost facility, where fragments of polyethylene diminish or even destroy the product's value for agricultural and landscaping use. To make a highly marketable compost product, the polyethylene plastic has to be removed from the organic feedstock, often at great cost to the composter for debagging or additional screening. These costs ultimately are passed along to the public in the form of higher tip fees or—less frequently—increased product pricing. If the community runs its own composting operation, more public revenues will have to be expended for disposal of the polyethylene plastic bags. Thus, a significant problem faced by those who operate blue bag systems is how to reduce the hidden costs

ventional plastic bags from compost sites effective statewide. So it is apparent that we can expect the desire for composting to continue to grow as a method to manage yardwaste. And as more and more compost facility operators understand the true burden that conventional plastic bags impose on their operations, these composters will increasingly refuse to accept compostables in polyethylene bags.

Eliminating the Polyethylene Bag

One way to deal with the problem is to entirely eliminate the bag from the collection process by using dedicated bins and cans for separately collected yardwaste. This is often not an attractive option for many communities because of the substantial expenditure for equipment involved. Residents also have shown resistance to such programs because they prefer the convenience of bags for collecting their yardwastes. They especially do not like having to clean out the smelly and messy yardwaste cans and bins.

In Michigan, a bill is pending in the legislature to make the ban on conventional plastic bags from compost sites effective statewide

of the blue bag—in other words, to make the blue bag green.

Elimination of the conventional plastic bag from their operations has become a major goal of composters. In many communities, composters backed by local ordinances refuse to accept yardwastes in polyethylene bags. Presently, 26 states restrict or prohibit the disposal of yardwastes in landfills, and this trend will continue to grow. In Michigan, a bill is pending in the legislature to make the ban on con-

Fortunately there are bags that are composter-friendly. Biodegradable and compostable bags exist for the collection of yardwastes. Kraft paper bags are familiar to many, but they do have their drawbacks. Rain or excessive moisture will cause the bag to break open when lifted. For haulers collecting the bags curbside, the problem is that the content of the bag cannot be readily seen, decreasing the opportunity for rejecting nonconforming material at its point of origin. Additional-

ly, the Kraft bags are bulky and difficult to store in quantity, a problem when dealing with large quantities needed in any municipal program whether the bags are distributed by the municipality or purchased by residents at retail outlets.

There is another option: biodegradable plastic bags. About five years ago, truly biodegradable plastic bags became commercially available. The bags are made of starches in combination with fully biodegradable polymers or polylactic acid. A previous approach to the problem of biodegradability saw the introduction of bags made from resins that combined polyethylene, starches, and heavy metals (such as cadmium, lead, beryllium, and so on). While some of these earlier bags are still on the market today, they do not meet the criteria for classification as "biodegradable" and "compostable" recently adopted by the Degradable Polymer Council of the Society of Plastic Industries, the leading US trade association for the plastics industry.

The True Cost of Polyethylene Bags

There are three basic handling and processing costs incurred by the operator of a compost facility when dealing with polyethylene plastic bags: (1) the cost of debagging or removing the organic contents from the polyethylene bags, (2) fees for disposing of the compostable materials that are inevitably contaminated with plastic, and (3) the revenues lost from having to dispose of the otherwise good compost that is contaminated with plastic.

Debagging is accomplished either mechanically with debagging machines or manually by workers. Rod Tyler, field representative of the (US) Composting Council, has calculated the cost of debagging to be 3.75 cents per bag or 11.7 cents using manual labor. On average, 60 bags are used to collect 1 ton of material—one bag holding about 33 lb. of material. A ton of yardwaste will cost

\$2.25 for mechanical debagging or \$7.02 for manual debagging. If a facility handles 15,000 tons of material per year—production of what is considered to be an average facility—then the annual cost of debagging would be \$33,750 mechanically or \$105,300 manually.

The most significant cost to the composter is the cost of disposing of compost that remains contaminated with polyethylene fragments. No debagging system—whether mechanical or manual—is 100%

have been made through compost sales if the polyethylene-contaminated overs were eliminated and instead sold as high-quality compost. If the 3,000 tons in annual overs were sold at, say, \$10/ton, the composter would realize an additional \$30,000 in revenue. The table below shows the cost of handling polyethylene bags over a range of different disposal costs for the overs. The table is based on a composter who processes 15,000 tons of compostable material per year.

Achieving public support for the use of biodegradable bags is not, however, an easy sell since the front-end costs—those involving cold, hard cash—are decidedly higher. What is more difficult to portray is the overall picture where the value is a matter of avoided costs—a much harder concept to sell. While residents will pay less up front for the polyethylene bag, at some point they will have to pick up the higher operating costs as well. Private composters will almost

Cost of Conventional Plastic Bag Handling

(Based on 15,000 tons of feedstock processed per year)

Disposal Fees	Overs Disposal	Debagging	Lost Sales Revenues	Total Costs
\$40	\$120,000	\$33,750	\$30,000	\$183,750
\$50	\$150,000	\$33,750	\$30,000	\$213,750
\$60	\$180,000	\$33,750	\$30,000	\$243,750
\$75	\$225,000	\$33,750	\$30,000	\$288,750
\$100	\$300,000	\$33,750	\$30,000	\$363,750

effective. Even after debagging, a significant portion of the feedstock will contain polyethylene fragments, which accumulate and cannot be removed. The contaminated feedstock—known as overs—is wasted and must be disposed. There are two basic costs to disposing of the overs: (1) the cost of hauling to a disposal site and (2) the disposal site's tip fee. Again, Tyler estimates that approximately 20% of the otherwise compostable material ends up on the overs pile, even at the best-managed composting facility that accepts material in polyethylene bags. Thus, a composting facility that takes in 15,000 tpy will produce approximately 3,000 tpy of overs. If disposal costs run \$50/ton, the annual cost of disposing of the overs is \$150,000. For disposal costs of \$60 or \$75/ton, the burden for overs would be \$180,000 or \$225,000, respectively.

Finally, there is another cost that is often overlooked: the lost revenue that could

While the price of biodegradable and compostable bags—including Kraft paper bags—are presently about two and a half times that of conventional plastic bags, the apparent penalty disappears in the light of full-cost accounting. The composter who processes 15,000 tpy will receive approximately 900,000 bags (60 bags per ton of material). The average cost of a polyethylene bag is 12 cents for a total cost of \$108,000, while the average cost of a biodegradable bag is 30 cents for a total cost of \$270,000. This \$62,000 cost difference would appear to defeat the selection of biodegradable bags for the blue bag system. But when the cost savings that can be realized from the elimination of polyethylene bags are considered, the balance clearly tips in favor of the biodegradable bag. The biodegradable bag is economical and cost-effective in light of disposal costs of the overs.

certainly charge a higher tipping fee to cover those costs, whereas a publicly run facility will incur greater management costs. The end result is higher taxes or fees for the community's residents.

When a community mandates biodegradable bags to replace polyethylene bags, the cost savings resulting from the biodegradable bags should be passed on to the community. If the community operates its program through a private composter, the solid waste department should acknowledge a reduced tipping fee for yardwaste management. If the community operates its own composting facility, its operating costs will be reduced. Either way, the cost savings should be enjoyed by the residents in the form of lower fees for solid waste disposal. **MSW**

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