Food waste composting: institutions get a taste

by Tom Watson
Resource Recycling

Interest in food waste cornposting is growing as schools, prisons and camps get into the act.

"From plate to plant." That's the concise description Jim Marion gives for the new food waste composting program at the Frost Valley YMCA camp in New York State, where the finished compost goes into a potting mix for plants in the camp's greenhouse.

The Frost Valley system is one of the few operating institutional food waste composting systems in the country, but it should soon have lots of company. Enthusiasm for food waste composting has never been greater, and New York State in particular is fertile ground for this earthy form of recycling. A different, more basic type of food waste system has been working well at a state prison there since last spring. And Marion, who developed the Frost Valley program, recently left his job at the camp to take a new position as recycling manager for the New York State Department of Corrections. He plans to expand food waste composting eventually through much of the prison system, which includes 61 facilities and houses 55,000 inmates.

Institutional food waste composting refers to programs that collect and process food trimmings, scraps and leftovers from facilities such as schools, prisons, camps, hospitals or military bases. This story focuses on that type of composting. Along with the more common commercial food waste composting (which might handle waste from food processing plants, for example), institutional food waste composting has grown in stature as landfill fees have soared and the relative simplicity of composting has become more apparent.

The road to residential

Many in the recycling industry believe the time will come when residential food waste separation (perhaps with other wet or organic items) for composting will become a basic part of life in America, as it is in parts of Europe. (Next month's issue will look at food waste composting in Europe.) Some feel that the public is ready for it now, and several Canadian cities are moving toward this already. But a more common perception in the industry, especially in the U.S., is that it will take time for most people to get used to the idea of putting their food scraps anywhere other than a garbage can.

Because institutional food waste composting can help introduce people to the concept - if they hear about their children doing it at school, for example - it has great potential as an educational tool. But what most officials running an institution really want to know is whether it will save them money, without too much hassle. Fortunately, it looks like food waste composting can bring home the bacon in this respect as well.

At Frost Valley, the composting system's operating costs for labor and energy are expected to average less than $30 a ton, Marion says. This compares with the camp's current landfill cost of $105 a ton. Total capital costs were $175,000 for the building and equipment for the modern aerated static-pile system; that does not include substantial in-house labor. Serving as a summer camp, a conference center and an environmental education camp, the 4,700-acre Frost Valley spread in the Catskill Mountain handles about 30,000 residents a year. During the height of the summer season, the camp sometimes produces a ton of food waste a day.

For a facility such as this with a large population, food waste composting is definitely economically viable, says Aga Razvi, a composting pioneer who has been performing various types of research in the field for years. Director of the solid waste management center at the University of Wisconsin at Stevens Point, Razvi helped with the original design of the Frost Valley program.

Food waste "is the easiest fraction [of the waste stream] to get rid of and use on the same grounds," says Razvi. "Certainly universities - dormitories and so

on — could really benefit from something like this." Food waste is a relatively clean compostable material, and many institutions already separate their food waste and run it through a de-watering system to reduce the weight of their garbage.

An unanswered question for researchers is whether food waste composting at a large institution can be successfully done over the long term with an open-air windrow system, which is considerably less expensive than an in-vessel or aerated static-pile system. Bruce Fulford, compost programs director for Tellus Institute, a nonprofit research group in Boston, believes a windrow system would sometimes be the best option "if it's managed well." While not quite as enthusiastic, Razvi also feels a windrow system could be effective "depending on how well you manage the windrows." Odor and animal problems with a windrow operation are the biggest fears.

Cornposting behind bars

But neither has been a problem so far for the adjoining Shawangunk and Wallkill correctional facilities in New York State, which compost their food wastes together. The 1,000-acre prison site, which includes dairy farms, is located about 50 miles north of New York City.

Shawangunk began food waste separation and composting last spring, with Wallkill going on line in August. The two facilities combined have more than 1,000 inmates. About 70 cubic yards of compost had been produced as of early September, says Charles Landi, a maintenance engineer at Shawangunk who has spearheaded the program. The material is being stockpiled, but this winter it will be spread on the farmland inside the prison, he says. Eventually it will be used for prison landscaping and horticulture programs.

Equal parts of food waste, cow manure and wood chips are mixed in windrows on a concrete pad. A front-end loader turns the piles about twice a week. Composting is completed in six to eight weeks, Marion says. The material is not screened. Before the compost is used for landscaping it would have to be screened, since it contains sizable pieces of wood.

Inmates hired as "recycling porters" handle separation and collection of food waste and other recyclables in the kitchens. In the dining halls, the prison staff make sure inmates put food waste in a separate bin (adefinite advantage prisons have over other institutions).

The extensive overall recycling program at the two prisons, including the food waste composting, has cut disposal costs in half, from $112,000 a year to $56,000 a year, according to Landi. The amount of waste that goes to the landfill is only about one-third of what it used to be, Marion adds.

Cornell gears up for demonstration

To evaluate windrow composting of institutional food waste scientifically, Cornell University at Ithaca, New York plans to begin a demonstration project next spring. The campus generates more than 1,000 tons of cafeteria food waste annually. To test the effects of windrow-turning methods on the distribution of oxygen and temperature, one windrow will be turned by a front-end loader and another one will be turned by a windrow turner, says Thomas Richard, a biological engineer on Cornell's research staff.

Richard, who assisted with the design of both the Frost Valley and Shawangunk/ Wallkill systems, heads the Cornell project. He says issues to be studied include animal and odor control, time and management requirements, and the optimal mixtures of food waste with farm or yard wastes.

Because of the wet, dense nature of food waste, it must always be composted with a bulking agent, to allow for more air circulation. "The best bulking agent," says Aga Razvi, "is whatever is available locally for the least cost." A wide range of possibilities exists, including leaves, wood chips and shredded paper.

In the Frost Valley aerated static-pile system, two parts wood chips are mixed with one part food waste, and water is added "to taste," says Marion. At the end of the six-week composting process, the material goes through a four-by-eight-foot trommel screen. The bulk of the wood chips are recaptured and used again, moving through the process several times before they decompose. The remaining material goes to curing piles for three to six weeks.

Cornposting with kids

An institution certainly doesn't have to be big to compost its food waste. The Underhill Incorporated District School, a 130-student kindergarten through fourth grade school near Underhill, Vermont, began composting all its cafeteria food scraps last year, as a school project. They use a glorified home composting system consisting of three bins made of wooden shipping pallets reinforced with wire. Students and friends contribute bulking agents such as leaves, sawdust and wood chips. Odors and animals have been slight problems at times, but nothing serious, teachers say.

The fourth graders run the program, turning the piles and helping younger students separate their waste, says Underhill teacher Mary Weith. She says the composting and other recycling efforts have saved the school money in avoided disposal costs and have been extremely educational for the children. Inspiration for the school's extensive recycling and composting program came from the teacher's resource guide put out by the Association of Vermont Recyclers.

Guelph wants it all

Three schools also separate their food waste for composting in Guelph, an Ontario city of 85,000 about an hour's drive west of Toronto. But the system there is much different, since the schools are part of a city-operated pilot program that includes 860 households. Several additional schools, along with apartment build-

Ten issues for institutions considering food waste composting

- How will it affect current food waste handling operations?
- What will it cost?
- Will it be composted on-site or off-site?
- If off-site, how will it be transported?
- Should an enclosed system or open-air windrows be used?
- If windrows, are there potential odor and animal problems?
- Will collection and composting comply with local health department regulations?
- Are there markets for the final product?
- Will perceived problems with pesticides (from produce trimmings) and pathogens create marketing difficulties?
- What kind of testing will be required?

Source: *Resource Recycling* and Bruce Fulford (Tellus Institute), 1990.

ings and commercial facilities, are scheduled to be added to the pilot project this fall, says Dan Hoornweg, the city's waste management coordinator. Some participants separate their waste into two streams, "wet" and "dry," while others are asked to use a three-stream system with one container for compostables, one for clean recyclables and one for garbage.

Guelph plans to choose some type of wet-dry program and hopes to put it into effect citywide in 1992. This program will recycle and compost the waste from "all businesses, residences and institutions. No exceptions," says Hoornweg. "We think we can divert 50 to 70 percent of the total waste stream, with today's markets."

Several other communities across Canada have tested programs that include food waste composting, or are planning them. A small pilot project in Powell River, British Columbia involving the separation of food and yard waste from garbage was reportedly well received by residents. The Metropolitan Toronto Works Department is planning a 190-metric-ton-per-day composting plant for organic waste. If all goes well, a site will be chosen this fall and the plant will begin operating within' two years, says Vito Ariganello, project director for new technologies and policy development for the agency's solid waste management division. The plant would handle food waste from major sources such as food distribution terminals and canneries, but may include food waste from schools and other institutions, he says.

Composting the Big Apple

New York City is planning a pilot residential food waste collection program for composting that will probably start with 3,000 households, says Bruce Fulford of the Tellus Institute. Tellus has been working with the city on initial design of the collection program. New York City's request for proposals for a firm to manage the collection and composting pilot is expected to be issued this fall.

Although the New York City project will likely not include institutions, information about technology that will be gained in the study will be useful for institutional and commercial food waste composting efforts, Fulford adds.

Other options

Methods of keeping food waste out of the waste stream are not limited to composting. Biogas systems that recover methane through dry anaerobic digestion have been tested on food waste with some success. In a time-honored method, some institutions such as Rutgers University in New Jersey ship out their cafeteria food waste for animal feed. The practice has dwindled in recent years.

Lawyers in some areas have reportedly advised against the practice, fearful that a farmer will sue the institution if the pigs get sick from eating the food waste.

Composting at the Animal House

Food waste composting may be gross to some, but it will soon be a fact of life, in the recycling industry and in society at large. Nationally, food waste makes up 10 to 15 percent of the total waste stream, according to Cornell University's Richard. With relatively simple procedures, it can be reborn as high grade compost. Will Americans ever reach the point where they'll see a food fight scene on TV or in the movies and say, "Gee, they should be composting that stuff!"? Stay tuned.

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A National Recycling Coalition technical council on composting is now being formed. Its structure will be similar to that of the NRC rural recycling council described elsewhere in this issue. For more information, write to the National Recycling Coalition, 1101 30th Street NW, Suite 305, Washington, DC 20007.

For information on food waste composting in the New York State prison system or at the Frost Valley YMCA camp, write to Jim Marion, New York State Department of Corrections Recycling Manager, Sullivan Correctional Facility, P.O. Box AG, Fallsburg, NY 12733. You can also call him at (914) 434-2080, extension 309.

To receive information sheets on system design for small-scale cafeteria food waste composting, send $2 to: Recycling Section, Vermont Division of Solid Waste Management, 103 S. Main St., Waterbury, VT 05676. Attention: School Cornposting.

The Association of Vermont Recyclers has copies of its teacher's resource guide available ($25 in Vermont, $45 out of state), along with an implementation booklet for teachers for $6. Both feature composting and recycling activities. Write to the association at P.O. Box 1244, Montpelier, VT 05602.