

# COMMERCIAL FOOD WASTE COMPOSTING RESEARCH REPORT 1998-99

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## Program Goals

Facilitate the greatest possible diversion of food wastes from the landfill by:

- Researching the potential for commercial food businesses to divert food waste from the landfill through the use of on-site in-vessel composters. Research includes conducting waste audits, helping businesses with on-site separation of organic wastes, monitoring composter operation, evaluation of system efficiency, and estimating food waste diversion tonnage.
- Establishing a rebate program to encourage ten (10) food businesses to purchase and operate an in-vessel composter at their site.
- Demonstrating composting of food waste to other food businesses in Sonoma County.
- Providing technical support to foster the success of waste separation and breakdown of food wastes in the composting/vermicomposting process to avoid potential problems.
- Providing an unbiased evaluation of the in-vessel composters.
- Providing source separation training for participating food businesses and monitoring food waste separation on a weekly basis.
- Providing for a publicity/educational event to notify other potential users and generators of food waste.

## Background

Based upon a waste characterization study conducted in May 1996, 42.8% of the Sonoma County commercial waste stream is compostable and includes 13.7% (19,600 tons) commercial food spoils. This portion of the waste stream has traditionally been difficult to reduce



because of the inherent difficulty in handling and composting food waste, but represents a significant portion of the waste stream.

An increasing number of communities nationwide are considering composting as an essential part of a comprehensive waste management strategy. The fastest growing composting projects include commercial and institutional "organics". Surveys in 1997 and 1998 by BioCycle magazine indicated a dramatic increase in composting projects accepting commercial and institutional food waste. In 1997, there were 220 projects nationwide, which rose to 250 in 1998. This project was included as one of the projects in a list of pilot programs in BioCycle, October 1998 (see appendix E).

Last year we received \$6,450 to demonstrate the potential for composting food waste at a special event, food businesses, and institutions. We rented a Green Mountain Technology's "Comp-Tainer" (renamed Earth Tub) and used it to compost the food waste from the 4-H Chicken-Que in 1997 and 1998, Mistral Restaurant, the SRJC Cafeteria, and Food For Thought grocery store. The machine was moved to each location for approximately 2-3 months and evaluated for efficiency and ease of operation by on-site and UC staff.

Green Mountain Technology's Earth Tub has a retail cost of approximately \$6,500. The machine is a cone shaped cylinder with a diameter of 89 inches and is 48 inches high. It weighs 300 lbs. and is constructed of plastic and foam insulation. Its capacity is 3.5 yards<sup>3</sup> and can be filled with 100 to 200 pounds per day of organic materials.

The machine has a motorized auger mounted to a rotating lid that is turned by pushing the lid around in a circle. The auger mixes the lower materials with the upper materials and is set in place on a sliding metal sleeve within the lid that allows it to be moved toward the center, middle, or edge of the circular tub. The mixture was usually turned once for each of the three positions of the auger. The unit has two clean out ports, on opposite sides, for access to remove the finished compost.

The in-vessel composter machine, from Green Mountain Technology, that we tested was the most practical machine on the market with some track record, reasonably affordable price, fairly compact size, and available for demonstrations. The machine was an early "demo" model with design problems, primarily the warped lid that led to rainwater intrusion and the auger hitting the bottom screen. Subsequent models have corrected the mechanical problems, along with upgrades that make operation more efficient.

Research was conducted to determine the volume of material composted, temperatures reached in the process of composting, needs for source separation, electrical hook-up, and labor needed to operate.

The actual composting process of adding a small amount of bulking agent and food scraps periodically was not complicated and the mixtures began composting within two weeks and heated up to rapidly decompose reasonable quantities of organic materials.

The time requirement in separating out compostable materials was not a burden for the participating businesses nor was the time required to periodically turn the mixture.

Some care needed to be taken not to get the mixture too wet, not to add excessive quantities of either high carbon materials or nitrogen materials all at once. When large quantities are added, additional care was taken to make sure the composting process was proceeding adequately by monitoring the temperature periodically. Clean out of finished compost was easily achieved, by hand with a scoop shovel, through the two ports located on either side.

The concept of composting food waste on-site with a small-containerized mixing machine such as this has merit and was well received by several food businesses in the county. It was estimated that the composter could pay for itself in lower trash hauling fees in about three years. Some food businesses expressed a genuine interest in purchasing some type of composting machine and operating it near their trash bins, but most felt that the initial cost was prohibitive.



*Earth Tub in action composting food waste and paper plates*

A 1998 survey of seventeen businesses interested in composting their food wastes indicated that an incentive of \$1,000 to \$3,000 was necessary to get most of them to purchase an in-vessel composter. Together with the Sonoma County Waste Management Agency, we then established a rebate program offering a maximum of \$2,000 off the purchase price to the first ten businesses to take part in the program. If different types of machines were purchased and operated, it would give the program a chance to evaluate the performance of those machines rather than try to test one machine each year over a period of years.

For the rebate program, the food businesses would be responsible for the electrical hook-up, energy costs, permits, and operation of the in-vessel composters. Equipment manufacturers would be responsible for technical support of machine operation. Rebates were to be handled directly through the Sonoma County Waste Management Agency.

This program was conducted by a part-time assistant (10%), Linda Peterson, Staff Research Assistant, in cooperation with Horticulture Advisor, Paul Vossen, and James Johnson UCCE Senior Program Assistant.

## **Summary of Objectives Achieved**

Six Green Mountain Technology “Earth Tubs” have been purchased and delivered as part of the rebate program. Two machines are located at Food For Thought in Santa Rosa, two at the Sonoma Developmental Center in Glen Ellen, one is at the Food For Thought

store in Sebastopol, and one is located at the Vineyards Inn in Kenwood. The Food For Thought machines are operational. Vineyards Inn owner Steve Rose has put his machine on a concrete pad on his property about 1/2 mile from his restaurant, and it is operating also. Sonoma Developmental Center is preparing their site - they will be putting fencing around the bins to keep residents out, hooking up electrical and plumbing, and possibly putting the earth tubs up on a platform.

Linda Peterson, James Johnson, and Paul Vossen contacted hundreds of businesses with written information through a personal letter accompanied by an informational flier (see appendix F). Of these people that expressed interest, a select number were given follow up phone calls. Many people in the food business were also contacted in person to generate interest in the purchase of an in-vessel composter through the rebate program. Green Mountain Technology offered an additional \$1,000 discount if we could jointly order and purchase 10 machines at once. They ultimately provided the discount for six machines purchased with the hope that operational machines in the area might attract additional business for them.

#### Business Lists Contacted:

- Restaurants Association of the Redwood Empire (RARE) (340)
- UC internal list of businesses interested in commercial food waste composting (67)
- Select Sonoma County's "store" list (24)
- Sonoma County Grocers Industry list (50)

#### Individual Businesses Contacted

- Andy's Produce
- Fountain Grove Convention Center
- Community Market
- Midtowne Realty
- La Tortilla Factory
- Petaluma Coffee Company
- Healdsburg Bear Republic Brewery
- Culinary Arts Institute
- Hewlett Packard
- OCLI
- Sonoma County Fair Grounds
- Richard's Grove and Saralee's Vineyard
- Rainbow Resort
- Sonoma State University
- Kaiser Hospital
- Sonoma County Fairgrounds
- McNair's Restaurant
- SSU Agroecology Department
- Jewish Reform Camp
- SC Detentional Facility
- Sonoma Market
- Ritz Food
- Cricklewood Restaurant
- Los Guilicos Juvenile Hall Cafeteria
- Health & Harmony Festival
- Pacific & Fiesta Markets
- Chateau Souverain
- Park Avenue Catering
- The Kitchen (Graton)
- Food For Less
- Mistral Restaurant
- Santa Rosa Junior College

Publicity:

- San Francisco CRRA Food Recycling Conference: Linda Peterson spoke on the pilot project and rebate program
- Article in "The Bottom Line" supplement to "The Business Journal"
- Insert in RARE Bits newsletter
- Write-up in "The Independent"
- Biocycle Magazine Article - 10/98 (appendix E)
- Participation in two Food For Thought "Family Food Night Natural's" at Santa Rosa and Sebastopol stores

Waste Audits Conducted:

Food waste and other compostable materials averaged 66% of the total waste generated by these businesses. Figures are given in tons per year (tpy).

- Fiesta Market - 119 tpy compostables
- Pacific Market - 41 tpy compostables
- Food For Thought/Santa Rosa - 105 tpy compostables
- Food For Thought/Sebastopol - 176 tpy compostables
- Food For Thought/Petaluma - 104 tpy compostables
- Sonoma Developmental Center - 28 tpy compostables
- Vineyards Inn - 20 tpy compostables

**Timeline for the In-Vessel Composter Rebate Program.**

<b>ACTIVITY</b>	<b>DATE</b>
Recruit Rebate Participants	7-98 to 4-99
Waste Audits	7-98 to 6-99
Placed Order for 6 Earth Tubs	October 98
Arrival of Earth Tubs	4-15 to 4-24-99
3 Tubs operational at FFT	Started filling 5-20-99
Tub operational at Vineyards Inn	Started filling 5-31-99

The coordinators and participants in this program shared information with other compost bin owners around the country (Oregon, Washington, Hawaii, Florida, Kentucky, & Wisconsin) and with others around world (Belize, Japan, Switzerland, and England) interested in foodwaste composting with an in-vessel system. Many contacts were also made with interested food waste composters in other areas of California (Santa Cruz, Berkeley, Bolinas, Napa, San Jose, Livermore, and Irvine).

## **Conclusions & Recommendations**

Due to the late start in trying to get 10 businesses signed up for the rebate program to take advantage of the additional discount offered by the manufacturer, no operational data was collected. Averaging the seven food waste audits that were conducted, however, indicate a significant potential for landfill waste reduction by diverting food waste (85 tons per year per institution, restaurant or grocery store) into compost and out of the traditional waste stream.

There was inadequate time for machine user instruction regarding on-site separation of organic wastes, monitoring composter operation, evaluation of system efficiency, and estimating food waste diversion tonnage. Participating businesses will need help for the next few months, and the machines will require evaluation by UC and county staff. The recommendation is to extend the contract for an additional six months until December 31, 1999 to accomplish the above goals with the six functioning in-vessel composters.

## **Summary of Project Failures**

It was very difficult to convince 10 businesses to participate in the rebate program and purchase an in-vessel composter. The six machines that were ultimately purchased were from only two businesses and one institution. They would not have participated without the \$2,000 Waste Management Agency rebate combined with the \$1,000 manufacturer's discount. Media attempts at publicity for the rebate program were unsuccessful, except for one article in The Independent, which ran a small article listing the wrong phone number.

We received some feedback from potential participants that their locations were not right for this type of machine. They expressed concern that it may need to be covered or enclosed in a locked fenced area to prevent vandalism. Electrical hook-up needs for hard wiring the unit and a drain located nearby with a direct hook-up for leachate would be the best way to handle excess moisture that accumulates. Some did not have easy access to drainage or electrical connection.

Others expressed concern for operation of the machine, dealing with the finished compost, and potential odor problems. Many of the grocery stores have farmers/gardeners picking up produce scraps for animal feed and expressed a lack of need of an alternative waste management system.

One potential participant backed out twice. Another was late coming on board (Sonoma Developmental Center). Manufacturing delays (Oct - April) were also a problem because the molded lids were not the right size and had to be re-made; parts were being shipped back and forth from the East and West Coast which took a long time.

GMT agreed to honor their discount offer, even though 10 units were not purchased, with the thought that once composters were in place and functioning, other businesses could see them in action and become interested in purchasing one. The Earth Tubs did not arrive until April 15 and 24, 1999. By the time businesses got their systems set up and running and began adding compost, there wasn't enough time before the end of the project contract to fulfill the project goals.

## Tonnage Diversion Estimates

Due to the late start in getting the in-vessel composters operational, tonnage diversion estimates are not available at this time. The GMT Earth Tub has a potential to compost about 150 lbs. per day according to manufacturer specifications.



*Demo "Earth Tub" setup at  
Food For Thought in Santa  
Rosa in 1998*



*New model "Earth Tub" setup  
At Food For Thought in  
Sebastopol in 1999*

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