

## **Composting Case Studies: Cornell University, Ithaca, NY**

### **\*\*2009 update on the [Cornell Farm Services Compost Facility](#)**

In December 1997 the Cornell University Farm Services Department, with the guidance of Cornell's Waste Management Institute and cooperation from the University's Dining Services, began composting food scraps from the campus' dining facilities. With nearly 19,000 students, Cornell produces an estimated 700 tons of compostable food scraps annually about 17% of the University's waste stream that had been going to a landfill.

Cornell formed a unique partnership to facilitate the food scrap composting program. The cooperating players were Gary Tennant, CU Farm Manager, Dan Winch, CU Farm Services Compost Project Manager; Margaret Rodger, Associate Director of Campus Life, Division of Dining and Retail Services; and Jean Bonhotal, Extension Associate at the Cornell Waste Management Institute. The Division of Dining and Retail Services pays Farm Services the same rate per ton to collect and compost their food scraps as they would have paid to have the food scraps landfilled. This arrangement provides funding for the program, which does not receive any other financial support, and allows Dining to participate in a resource-saving program at no additional cost.

#### **Separation and Collection**

CU staff in the dining halls separates the food scraps on campus. Both pre- and post-plate wastes are collected. Scraps are collected in 32–35-gallon plastic barrels on casters. The majority of the scraps are ground and dewatered by dining staff in a pulping machine which was in operation prior to composting. The project manager held hour-long training sessions with the staff at all of the dining halls. These sessions consisted of a 20-minute presentation on the program followed by working with the staff in each dish room and food-preparation room to come up with a good system for collection. In every case there was at least one person with a strong interest in the program that took the lead in organizing and educating others. Education and providing feedback on how employees are doing is important to keep enthusiasm high and ensure that the program will continue to thrive. Good signage and education are especially important in situations where a portion of the staff turns over each semester.

Food scraps are collected daily in a small pickup truck with a sealed dump body and taken to a staging area at the Farm Services Complex for mixing. Once collected, the scraps are dumped into a dump truck bed, which is lined with six to eight inches of bedding material consisting of sawdust and manure from cleaning stalls at the Veterinary College facilities. The bedding is built into a dam at the rear of the truck bed to prevent leaks on steep inclines. It also allows the scraps to slide out of the truck cleanly, avoiding daily washing. Two staff members spend about an hour to collecting food scraps from four facilities. A truck is being retrofitted with a lift so that campus facilities without loading docks will be able to participate in the program.

#### **Mixing**

Scraps are taken to the Farm Services Complex where they are transferred with a front-end loader from the truck body into an agricultural feed batch mixer with more of the sawdust/manure bedding to achieve the desired consistency and moisture content (approximately a 4 to 1 ratio of bedding to food is used) and blended for 5 to 10 minutes. The feed batch mixer has knife attachments on two of its augers to chop up any large pieces of cardboard or food. The mixture can be stored in the mixer overnight and then transported to the compost site using a tractor.

#### **Compost Method**

Prior to the addition of food scraps, Cornell's compost program, operated under an exemption from 6NYCRRPar 360-1.7 (b)(4)., composted a combination of 3250 tons of manure, 139 tons of greenhouse waste and 62 tons of miscellaneous other agricultural materials generated by Cornell on an annual basis. The compost site consisted of a 1.4-acre pad and a retention pond for leachate/runoff surrounded by a protective berm. To accommodate the extra volume from incorporating food scraps into the mixture, CU

added 0.3 acres to the pad area and another 224,000-gallon retention pond. In addition, CU developed a plan to use all excess leachate/runoff to moisten the compost piles and irrigate adjacent fields.

The food scrap mixture is added dually to the existing windrows. It is spread in sheets on the side slopes. The windrows are turned as needed based on temperature monitoring. When the internal temperature reaches 55-60° C (131-141° F), the windrow is turned and mixed with a SCAT windrow turner. Water or dry bedding is added as needed to maintain a moisture content about 40%. Wind conditions are taken into account when turning the pile to avoid odor problems and unwanted drying of the piles. The windrows are approximately 250 feet long, and 6-8 feet tall and 14 to 18 feet wide. The organic material is kept on the compost pad about six months before spreading.

Although there are no requirements for pathogen testing associated with food waste composting, Cornell voluntarily tests the material for fecal coliform and salmonella. Tests showed no evidence of either in the finished compost. To date, there have been no problems with digging or scavenging by wildlife. Curious animals and birds have explored the pile and taken advantage of the heat it gives off in cold weather, but have not caused any damage, or been a nuisance.

Currently, all runoff from the compost pad flows directly into the retention ponds which are protected from runoff of adjacent fields by a berm. Very little leachate is generated due to the large volume of sawdust and bedding added to the piles.

### **Compost Utilization**

The finished compost is spread on agricultural fields used for the production of animal feed. Runoff/leachate stored in the retention ponds is used to irrigate dry piles and adjacent hay fields. Complete curing is not required for this agricultural use.

### **Savings**

An estimated 700 tons of food scraps will be composted through this program on an annual basis. Although Dining is still paying to have the scraps composted, the "tipping fee" may be adjusted accordingly after the program has been in place long enough to gauge its cost. There are no plans to sell the compost due to state regulations, but the University benefits from the use of compost as a soil amendment.

### **Problems Encountered and Suggestions for Others**

Careful planning and good communication have prevented many potential public relations problems. Convincing the local town planning board was somewhat of a challenge because of the public's perception of how a large-scale composting operation would look and smell. In the end, Cornell's history as a "good neighbor" and the clean operation of the prior program allowed the project to expand.

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