



## CAMPUS SUSTAINABILITY

# ON-SITE FOOD WASTE COMPOSTING CLOSES THE LOOP

*Pre and postconsumer food scraps from dining and residence halls are mixed with yard trimmings and processed in a rotary drum followed by windrow composting.*

*Nora Goldstein*

**D**AVIDSON College in Davidson, North Carolina, with a student population of about 2,000, has been operating a campus composting facility since 2009. The source separated food scraps — both pre and postconsumer — are collected from the dining halls and residences and composted with ground yard trimmings, also generated on the campus. “We process about 400 lbs/day of food waste and 1,800 lbs/day of yard trimmings,” says Charles Jolly, Assistant Director of Grounds at Davidson College. “The program initially started with the Vail Commons. That facility reduced the food waste going to disposal by 80 percent.”

The composting facility is located under a roughly 4,000 square foot pole barn. The college received a grant from the Duke Endowment to build the facility, which includes a BW Organics rotary drum unit for the first phase of composting, a conveyor, a small chipper for the yard trimmings, and a compost curing area. “We also purchased a Hobart pulper for the Union Café,” says Jolly. “The dining hall already had a pulper. In total, it took about \$200,000 to get set up; about \$50,000 of that was for the pulper.” The BW Organics drum cost about \$40,000.

Food waste from the trays and prep areas is processed in the pulpers, collected in red barrels, and transported to the composting site. To ensure the barrels don’t get too heavy, fill lines were put about halfway up on the inside of the barrels. Filled barrels are stored in a cooler until they are collected. Davidson College experimented with using compostable cups made from corn gluten. “They broke down if we pulped them,” notes Jolly.

### COMPOST PRODUCTION AND UTILIZATION

Food scraps are added to the drum daily. The college purchased an 8 cubic yard (cy) drum, and processes about 6 cy on a continuous basis. To achieve a 3:1 C:N ratio, operators load one scoop of ground yard trimmings (about 0.75 cy) and two barrels of food scraps (about 0.25 cy) into a mixing unit equipped with augers. The unit feeds the mix into the drum. Materials are blended for 10 to 15 minutes; a trap door then opens and the material is fed into the drum. An equivalent amount of material is discharged from the drum onto a conveyor. The drum, which is set on a 2-inch slope, rotates on and off (operated by a timer). A fan provides continuous aeration. Total retention time in the drum is three days.



**Food residuals are collected in red barrels at the dining and residence halls (1). Yard trimmings and food residuals are blended in a mixer (2) and then loaded into a rotary drum (3). After a 3-day retention time, material is conveyed to a composting area (4), where windrows remain for 4 weeks prior to curing.**

**using an 2009 EZ - Screen 500 XL.** The screen size can go down as small as three-eighth-inch, he adds. About 50 cy of compost are produced annually.

The Dining Services department worked with the Grounds staff to convert flower beds outside the dining hall into herb and vegetable gardens. “During the summer, when it’s really thriving, it’s amazing how much we get out of there and how much we can use,” said Dee Phillips, Dining Services Director at Davidson College in a campus newspaper article. Student groups help manage the plots. “We were spending \$4,000/year on the

flower beds, and we are able to grow about \$1,500 worth of herbs annually,” adds Jolly. “We are producing about 75 percent of the herbs used on campus.”

Davidson College purchased a 150-acre farm, where it will install a greenhouse and a vermicomposting system. “We plan to grow vegetables for the school,” he says. In the meantime, the food scraps composting program has made a significant dent in the amount of trash the college generates. “We went from two 8 cy dumpsters emptied three times a week, to one 8 cy dumpster emptied twice a week,” notes Jolly. ■

Originally, the college was using chips size-reduced by the shredder utilized for logs and large size brush. The wood chips were too big, and got caught in the augers of the mixer. A Bear Cat chipper was purchased for the composting operation. It produces chips a half-inch in size or smaller, which work better with the mixer and break down more quickly during composting.

The discharge conveyor goes through a dividing wall and unloads onto a cement pad. “It takes about five days of output to make one windrow,” says Jolly. “Every Monday, we ‘flip a windrow’ using the Bobcat to move it down the bay, which can accommodate about four to five windrows.” The piles remain in this bay for about four weeks, and after which material goes to a storage area on the backside of the building. **Finished compost is screened**



**Davidson College purchased a small chipper dedicated to the composting operation as chips produced by the shredder used for wood and brush were too large.**

