

Composting Food Waste at UNCC

University of North Carolina at Charlotte
Office of Waste Reduction & Recycling



UNC-Charlotte and the Office of Waste Reduction & Recycling



- UNC Charlotte with its 1000 acre campus is the *fourth largest* of the 16 institutions within the UNC system
- *Founded in 1968*, UNCC is enjoying a period of profound growth and expansion.
- UNC-C has over *24,000 students* (5,000 residential students) supported by 2800 faculty/staff.
- The Office of Waste Reduction & Recycling *started in 1990*, we have *14 full time staff positions and 2 student workers*.
 - collect over 40 items to be recycled and remanufactured
 - 1,584,817 pounds in 2008-2009.
- In 2008-2009 composted 14,360 pounds of food.



The basics of composting.

What is composting? Composting is the natural breakdown of organic material to a dark, loose, soil-like substance that will substantially enrich any garden.

Why compost? Composting is a form of recycling that occurs continually in nature. It can significantly reduce the amount of household waste we throw away and at the same time provide a nutrient-rich additive for soils. It also reduces waste in our landfills.

Composting at UNC Charlotte in its 10th year



For 9 years we collected from the smallest of the 3 cafeterias on campus.



With the opening of the Student Union the café is closed and we collect all the kitchen scraps from the event kitchen



Food Scrap collection



- Food is scraped into 5 gallon buckets
- Twice a day the food is collected by the recycling crew
- Kitchen prep scraps are weighed and added to the active Earth Tub



EARTH TUBS



- Temperature is recorded and then scraps are added
 - try to maintain ~130 degrees



- Approx 120 pounds of food scraps and food preparation scraps/day
 - The tub starts with 550 pounds of sawdust in it and we add up to 2650 pounds feedstock (food scraps)





Mixing food waste, bulking agent and other feedstocks. The top of the Earth Tub is rotated with the auger on the far edge of the tub lid. The auger is then moved to the middle and the top is rotated again, but in the opposite direction.

Augering in the food waste





**22-24 working
days in tub**

- 10 days adding food,
14 days “cooking”

- Helps to dry out
the feedstock
which starts off at
78% moisture
content average in
tubs (will lose up
to 40% moisture
weight)

In-Vessel Composting Program at UNCC



2 Vessels

- 3200 pound (3.5 yard) capacity each
- Located next to the Crossroads café
- Awning and bollard added to protect bins



In-Vessel Composting Program at UNCC



Two Earth Tubs. Bio-filter in middle. Leachate from bio-filter goes into sanitary sewer system. White boxes on sides contain fans. Augers wired from above.

Aged compost ready to be emptied from the tub.



Staff emptying uncured compost.
It will be taken to a remote fenced-in area to cure.



Soil amendment

ready to use on campus and in the demonstration organic garden
next to the Earth Tubs



Demonstration Organic Garden



In early spring 2005, we thinned the plants. In late May this was what our garden looked like. During Summer 2005 the garden was watered ONCE.

Planted two tomato plants, one in the compost amended soil, one not.



The tomato plant in the compost amended section grew almost 2 feet while.....



The tomato plant in the un-amended section grew about a foot in the same amount of time.

Training Catering Staff



FOOD WASTE COMPOSTING

Please place all food waste in 5-gallon buckets.

What can go in the buckets?

YES

- Food preparation waste

NO

- Grease
 - collected separately for recycling
- Cleaning towels
- Cellophane packaging (wraps from crackers)
- Plastic (straws, tableware, etc)



*Leftover edible food goes to
Urban Ministries*

SUCCESSSES



➤ **Reduced Waste by**

- ❖ Cafeteria Changing serving practices
- ❖ Composting food waste and Sawdust

➤ **Water Quality Improvement** - preventing food waste from going into wastewater system

➤ **Saved money** through reduced collections on trash dumpster and eliminated collections on sawdust

➤ **Education** – very successful on and off campus. Off campus tours, graduate students studies, Civil Engineering class curriculum, outside agency tours, other colleges and universities, & part of Mecklenburg County PLANT and Master Composter program.

➤ **Campus Beautification -**

- Compost Demonstration Garden



Heavy Metal Plates placed over warped areas and attached to filter grate

Trials and Tribulations the First Year



Warped floor

Permit Application



- UNC Charlotte's in-vessel composting program is considered a Small Type 3 Facility.
 - The facility will process less than 1000 cubic yards of material per quarter; facility shall store less than 6,000 cubic yards of material per quarter and will occupy less than two acres.
 - Materials that will be composted include:
 - Pre-consumer food waste
 - Post-consumer food waste
 - Food waste will contain meat
 - Vegetative waste for bulking agent (wood chips from campus tree limbs) and high carbon wood nuggets (previously processed as bulking agent in Compost Central's composting process)
 - Post-consumer Paper napkins and towels
 - Untreated wood waste (sawdust from the College of Architecture)



In 2000 UNCC obtained two Earth Tubs through an Organic Wastes Recycling Grant from NCDENR DPPEA - the NC Department of Environment and Natural Resources Division of Pollution Prevention and Environmental Assistance

\$13,663.91 Tubs, \$10,486.09 Site Prep, \$6,852.03 University Matching Funds- Roof...



5A. Waste Audit: March 18, 1999 (compostable material from residence dining halls)

Waste Material:	Weight (lbs.)	% of Waste Stream	Recyclables by Weight (lbs.)	Compostable by Weight (lbs.)	Trash Weight (lbs.)	Total (lbs.)
Plastic & Glass Bottles:	8.80	2.65%	8.80			
Steel Cans	15.60	4.70%	15.60			
Paper						
News Blend	4.20	1.27%	4.20			
Unbleached Napkins/Towels	34.20	10.31%		34.20		
Heavy Duty "paper" towels	18.80	5.66%			18.80	
Cardboard	6.40	1.93%	6.40			
Office Paper	2.00	0.60%	2.00			
Trash	40.80	12.29%			40.80	
Plastic Trash Bags	2.60	0.78%			2.60	
Food	198.47	59.80%		198.47		
<i>Totals By Weight</i>	331.87	100.00%	37.00	232.67	62.20	331.87
<i>Total by Percentage</i>			11.15%	70.11%	18.74%	100.00%
<i>(assuming napkins/towels are composted)</i>						
March 17, 1999: 607 meals were served.						
<i>Weight per meal served (607 meals)</i>				0.383	0.102	0.486
<i>Food weight per meal served:</i>				0.327		
<i>Napkin weight per meal served:</i>				0.06		

COMPOST TUB 2 BATCH 1

2005/06

DAY	SUBTOTAL	TUES	WED	THU	441	MON	301	3297
DATE		9/27/	9/28/	9/29/	9/30/	10/3/	10/04/	0
FOOD SCRAPS	2013	137	77	69	92	148	153	2689
H2O CONTENT	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6
CARBON CONTENT	51	51	51	51	51	51	51	51
NITROGEN CONT.	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
BULKING AGENTS	440	0	0	0	0	168	0	608
TUB WEIGHT	2453	137	77	69	92	316	0	3297
# OF BUCKETS	14	0	0	0	0	0	0	14
NUGGETS	80	0	0	0	0	0	0	80
H2O CONTENT	65	65	65	65	65	65	65	65
CARBON CONTENT	75	75	75	75	75	75	75	75
NITROGEN CONT.	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
SAWDUST	360	0	0	0	0	168	0	528
H2O CONTENT	45	45	45	45	45	45	45	45
CARBON CONTENT	150	150	150	150	150	150	150	150
NITROGEN CONT.	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
? BULKING AGENT	0							
H2O CONTENT	0							
CARBON CONTENT	0							
NITROGEN CONT.	0							
H2O OF BATCH	79.79							79.41
C:N RATIO	28.71							30.13
TEMPERATURE	135.17	138	146	132	130	133	141	136.453
MANHOURS	21.50	1	0.5	0.5	1	0.5	1	26.00
	0							
DAILY FS AVG.	77.42	9	13	25.5	27	25.8	26	84.0313
FAN		ON	ON	ON	OFF	OFF	OFF	
VENT		off	OFF	OFF	OFF	OFF	OFF	
ADD WATER		no	no	no	no	no	no	
BIOFILTER		no	yes	no	yes	no	no	





	Compost FY Totals				
FY Year	Total Food (lbs)	Total Other (lbs)	Collection Savings	Landfill Savings	Landfill tip fee
2000-2001	31,871	2,859	\$ 997.92	\$ 347.67	\$ 21.00
2001-02	29,489	2,509	\$ 997.92	\$ 335.98	\$ 21.00
2002-03	15,961	5,027	\$ 1,042.92	\$ 220.40	\$ 21.00
2003-04	10,549	1,922	\$ 1,042.92	\$ 231.00	\$ 33.00
2004-05	23,383	2,250	\$ 1,042.92	\$ 422.94	\$ 33.00
2005-06	16,314	3,913	\$ 1,042.92	\$ 333.75	\$ 33.00
2006-07	18,865	3,937	\$ 1,042.92	\$ 405.60	\$ 43.00
2007-08	21,986	4,603	\$ 1,042.92	\$ 472.69	\$ 43.00
2008-09	14,688	3,259	\$ 1,042.92	\$ 315.79	\$ 43.00
Total	183,106	21,339	\$9,296.28	\$3,085.82	

Questions??



Web Site

www.uncc.edu/Recycling

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