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COMPOST FACT SHEET #8: Composting Liquids

COMPOST FACT SHEET SERIES 2004/2007

For these fact sheets and other
compost information:
<http://cwmi.css.cornell.edu/composting.htm>

Fact Sheet #1

Marketing Composts and
Meeting Consumer Needs

Fact Sheet #2

Regulation and Certification of
Composts

Fact Sheet #3

Improving and Maintaining
Compost Quality

Fact Sheet #4

Testing Composts

Fact Sheet #5

Compost Bulking Materials

Fact Sheet #6

Compost Pads

Fact Sheet #7

Compost Equipment

Fact Sheet #8

Composting Liquids

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Composting Liquids

Composting liquids seems like an oxymoron. Composting generally applies to solid and semi-solid organic residuals, but there are good reasons to consider composting liquids. There are all types of liquids that can be managed this way including liquid cow and calf manure, blood from slaughter houses, whey and waste from dairy processing plants, animal and vegetable based cooking oils and grease, and spoiled or outdated beverages. Traditionally, some liquids were spread on agricultural fields, but in areas with shallow water tables, spreading these liquids may cause ground and surface water problems. It may also cause odor problems and concentrate nutrients. Composting liquids requires large amounts of carbon-rich bulking material and takes careful management.

Reasons to Consider Composting Liquids

Manure with high water content is generally separated before composting, with the liquid portion being spread on fields. Using the method described in this fact sheet, separation is not necessary. There may be cases where disease and pathogen concerns favor not spreading the liquid component and thus not separating the manure. Blood from



Butcher waste composting in Randolph, NY.



slaughter facilities is getting harder to dispose of due to the decline in the rendering industry. Field spreading for nutrient value was acceptable in the past, but has its own set of challenges, including odor and neighbor complaints. Waste liquids from dairy processing are often land-spread when agronomically and environmentally compatible, but there are cases where facilities generate more than their land-base can absorb without over applying nutrients. Some of these liquids are shipped many miles for disposal and some businesses generate large volumes that require the company to have their own wastewater treatment facility. Animal and vegetable-based cooking oils and grease are challenging to manage. Historically strong markets in rendering have weakened. Fortunately the markets for biodiesel are increasing, but for small quantities and for oil contaminated with particulate matter as well as for biodiesel residuals, composting is an option. In all cases, if there is food or feed value it should be fully explored before choosing composting.

Siting, Construction and Management

Siting a composting facility for liquids shares the same concerns as any other compost facility (see CWMI Fact Sheet #6 Compost Pads: <http://cwmi.css.cornell.edu/compostfs6.pdf>). Criteria to consider include proximity to neighbors, distance to ground and surface water, wind direction/weather patterns, slope and convenience. Liquids may be an asset to a compost facility that composts dry, carbon-rich materials such as leaves, livestock bedded pack and other woody materials. However, regulation of these facilities varies from place to place. Some will be able to accept various liquids and some will not. Transporting liquids can also be expensive. Composting

Turning note: When turning, be considerate of neighbors. Turn when wind direction is away from neighbors and avoid turning on weekends and holidays.

facilities generally charge tipping fees as any waste treatment facility would.

Compost pad surface options will vary depending on regulation, soil types, volume of liquids and sensitivity of local groundwater. A hard surface is easier to work on and easier to clean up if there is a spill. The pad surface should be fairly level with a 1-2% slope. Facilities should plan for leachate control with berms, filter

strips, lagoons or collection tanks depending on the intensity of the operation (see CWMI Fact Sheet #6 Compost Pads: <http://cwmi.css.cornell.edu/compostfs6.pdf>). When securing bulking materials, remember that different carbon sources have different characteristics, wood chips are different than shavings, shavings are not saw dust.

Composting liquids requires large volumes of bulking material. Carbon sources such as woody waste, leaves, bedded pack or other carbonaceous, absorbent materials provide both needed carbon and pore space (see CWMI Fact Sheet #5 Bulking Materials: <http://cwmi.css.cornell.edu/compostfs5.pdf>).

Use the bulking material to build a windrow 8-10 feet wide by 5-8 feet high by as long as needed or as the pad allows. Make a trench down the center of the windrow with periodic dams to slow the movement of the liquid so it can be absorbed. Slowly pour liquid into the trench and allow it to soak into the carbonaceous materials. Make sure that the liquid does not pour in too quickly or down a slope because it will flow out the end of the windrow and end up on the ground. Liquids are hard to pick up when they spill. The windrow can then be covered with more bulking material and left to work passively or turned as soon as liquids are absorbed if location and feedstock allow. If you have close neighbors or are composting feedstock with potential odor it is best to implement the static pile method, letting the pile sit undisturbed. If turning, piles should be turned after liquids are absorbed and then again when temperatures drop below 110° F (43° C). It does not take long for liquids to process; 2-4 weeks depending on airflow and quality of the liquid being composted. However, you will not have a finished compost in 2-4 weeks; the remaining carbon can be reused to absorb more liquid repeating the instructions above or allowed to complete the compost process. The C:N ratio at the onset is such that there will be an excess of carbon to absorb the liquid, therefore the carbon can be used 2-3 times.

Blood is a little different. If it is still in a liquid form it is not hard to pour. If it has coagulated it is harder because it comes out in gelatinous chunks and clear liquid. Oils and grease will also solidify at cooler temperatures. The



Trench of wood chips for composting butcher waste in New Mexico.

problem with semi-solid liquids is they can slide out of the pile because they do not pour in a continuous stream. Be careful when incorporating semi-solid liquids, dams and well built trenches are especially important. It is also important to consider whether to turn these piles. They may have significant odors and it may be prudent to wait a few weeks before turning. If not turning the windrows, cover the trenches with carbonaceous materials to provide a bio-filter and make sure the mixture is porous enough to allow for good airflow. If a pile begins to smell strongly, cover it with more carbonaceous material, it will act as a bio-filter. The composting process will continue even under anaerobic conditions. Since turning will release odors, do not turn if odors are a concern.



Intervale compost pad in Burlington, VT.

Intervale Composting Facility

Intervale Compost Facility in Burlington, VT has been in operation since 1988. The facility composts many different types of feedstock that command different tipping fees. A tipping fee is a fee that is charged so that the facility is able to manage the different waste products. After the organic materials are processed into a compost product, the product is sold.

The site is 15 acres with a combination of gravel and cloth and gravel pads. A small portion of the pad where liquids are composted has an asphalt surface with a leachate collection tank. Intervale composts a variety of solid and liquid feedstock including hard cider residuals, cheese and ice cream waste, food grade grease and bio-diesel residuals, food, manure, and leaf and yard waste. Bulking materials are combined with liquids in the following manner. Leaves and sawdust bedding are combined for the carbon component and formed into two windrows 6-7 feet tall by 10-12 feet wide by 175 feet long. They contain approximately 240 cubic yards of material and hold between 7,000 and 10,000 gallons of liquid. After the liquids have been absorbed into the windrows, they are turned with a dedicated windrow turner. Windrows are then left to process or used in other compost recipes on site.

Site maintenance includes repairing the 1/8 acre mixing/liquid acceptance pad and cleaning the leachate collection tank. The tank is pumped periodically when it reaches capacity and the leachate is put back into trenches in the windrows. They have very few liquid breakouts. The liquid in the leachate tank is mostly rainwater running off the hard surface. If the tank were filled with strong leachate, it would indicate that their process was not working well and management changes would be made. Intervale owns an old pump truck, which they use to empty the leachate collection tank. Every few years the pump is reversed to mix the solids that have settled in the tank. The solids, then in suspension, are pumped out.

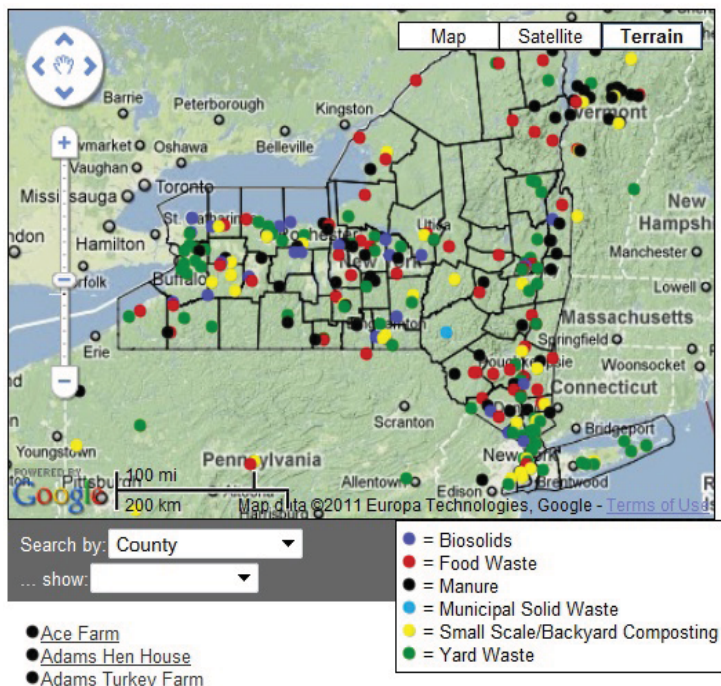


Dairy waste at Intervale compost site.

Map of a database of New York State Compost Facilities can be accessed at: <http://compost.css.cornell.edu/maps.html> (see example below).

New York State Compost Facilities Search

Please check the map and help us update the information by letting us know of additional facilities or other changes.



Cornell University Farm Services Compost Facility

Website: <http://cwmi.css.cornell.edu/farmservices.pdf>

County: Tompkins
 Owner: Public, College/University
 Contact: Bill Huizinga
 Address: Stevens Rd; Ithaca, NY 14850
 Phone: [607-257-2235](tel:607-257-2235)
 Fax: 607-257-2237
 E-mail: git4@cornell.edu

Feedstocks

Food Waste (Pre and/or Post Plate): Yes
 Floral waste and trimmings/plants: Yes
 Manures: Yes, research animal bedding - ; Cow, Poultry, Horse
 Other Feedstocks: compostable serviceware

Source of Feedstocks

Greenhouses/Florists: Yes
 Restaurants: Yes
 Manure: Yes
 Additional Information: All material comes from Cornell University campus facilities, no waste is accepted from outside the University. A tipping fee is charged to fund the site operation. The food waste includes pre and post consumer waste along with a large amount compostable paper and dinnerware items.

Compost Process

How is waste composted? Piled in windrows

Finished Compost

Is compost for sale?: Yes
 Is compost used on site?: Yes

SOME ADDITIONAL COMPOSTING RESOURCES:

- **Farm-Based Composting: Manure & More (video)** - <http://hdl.handle.net/1813/14193>
- **Natural Rendering: Composting Livestock Mortality & Butcher Waste:**
 Fact Sheet - <http://compost.css.cornell.edu/naturalrenderingFS.pdf>
 Video - <http://hdl.handle.net/1813/7870> (**English**) and <http://hdl.handle.net/1813/22942> (**Spanish**)
- **Co-Composter** - <http://compost.css.cornell.edu/CoCompost.html>
- **Compost...because a rind is a terrible thing to waste** - <http://compost.css.cornell.edu/FoodCompostpr.html>
- **On-Farm Composting Handbook** - http://www.nraes.org/nra_order.taf?_function=view&ct_id=6

For other composting resources see the CWMI web site at: <http://cwmi.css.cornell.edu/composting.htm>

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