



HANCOCK COUNTY PLANNING COMMISSION

**395 State Street
Ellsworth, ME 04605
207-667-7131
hcpc@hcpcme.org**

COMPOSTING: A SUMMARY OF OPTIONS FOR HANCOCK COUNTY



Composting:

- Why should we encourage composting?
- What are the types of compost?
- How do we get started?

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WHY SHOULD WE ENCOURAGE COMPOSTING?

Solid waste disposal costs are rising. Tipping fees for charter communities at the PERC regional solid waste incinerator are projected to increase by nearly 20 percent from \$67 a ton in 2013 to as much as \$80 a ton after 2018. According to an analysis by the University of Maine, food residuals account for about 28 percent of the municipal solid waste stream and yard and leaf waste for another 2 percent. Compost offers a way to reduce municipal disposal costs.

If correctly done, food residuals and some other organic matter can yield a valuable soil amendment. It is in high demand by farmers, landscaping operations, and back yard gardeners. Composting can be a profitable business venture. Hancock County Planning Commission staff is available to provide discuss compost options with towns and compost generators and help with the DEP permitting. This report gives an initial overview of types of organic matter and various composting techniques.



WHAT ABOUT ODORS AND PESTS?

A well-managed compost pile does not have odor and pest problems. The key is to have the right recipe or mixture in the compost pile. The recipe depends on the materials composted. Some can be composted with minimal oversight, others require a more complex management plan. The requirements are based in part on the carbon to nitrogen (C:N) ratio. The lower the C:N ratio, the greater the potential for odors and nuisances if a site is not managed properly.

WHAT ARE THE TYPES OF COMPOST?

The major categories of compost as defined by Maine DEP (Department of Environmental Protection) are:

Pre-consumer vegetable scraps, clean wood waste, and yard and leaf products (Type 1-A residuals): Type IA residuals are leaf, vegetative and other organics with a C:N ratio of greater than 25:1. It is not subject to DEP permitting if monthly volumes are under 10 cubic yards. Back yard composting generally can be done by home owners or businesses with minimal training.



Yard and leaf waste can also be composted on a municipal level. There are about 90 municipal yard and leaf composting sites in Maine and another 40 commercial sites. Storage piles

under 10,000 square-feet have simplified DEP permit-by-rule process.

Animal manure, produce and vegetable residuals with a N ratio of between 25:1 to 15:1 (Type 1-B): These materials are subject to DEP permitting if volumes are greater than five cubic yards in a 30-consecutive-day period. There are additional exemptions for farm-based operations (see below).



Farm Composting: Agricultural composting operated under a management plan approved by the Department of Agriculture, Food and Rural Resources has higher exemption levels than those for the composting operations discussed above. These include operations that compost between five and sixty cubic yards of Type IB and IC residuals in any thirty consecutive day period. Another exemption is for composting of any volume of Type IA, IB, and IC waste provided that at least 70% of the finished compost is used on the farm that produced the compost within two years.

Fish and other residuals with a C:N ratio of less than 15:1 (Type 1-C): An operation that receives over five cubic yards of Type 1-C residuals in a 30-consecutive-day period is subject to DEP permitting.

Sewage sludge, septage, and other residuals that may contain human pathogens (Type II): All operations are subject to DEP permitting.



WHAT ARE THE OPTIONS FOR COMPOSTING?

The options depend upon the type of material composted.

Backyard or Onsite Composting

As mentioned above, this type of composting is appropriate for low volumes of Type 1-A residuals. It requires very little time or equipment. HCPC (and other groups) sponsor periodic sales of compost bins. University of Maine Cooperative Extension sponsors workshops on backyard composting.



For an overview of home composting see:

www.epa.gov/waste/conserve/tools/greenscapes/pubs/compost-guide.pdf.

University of Maine Cooperative Extension offers periodic classes in backyard composting. For more information contact: Marjorie Peronto mperonto@umext.maine.edu or 207-667-8212.

Vermicomposting

Red worms-not night crawlers or field worms found in gardens- are placed in bins with organic matter in order to break it down into a high-value compost called castings. Worm bins are easy to construct (they are also commercially available) and can be adapted to accommodate the volume of food scraps generated. Worms will eat almost anything put in a typical compost pile (e.g., food scraps, paper, plants). Vermicomposting can be ideal for apartment dwellers or small offices that want to derive some of the benefits of composting and reduce solid waste. It is frequently used in schools to teach children conservation and recycling.

One pound of mature worms (approximately 800-1,000 worms) can eat up to half a pound of organic material per day. It typically takes three to four months for these worms to produce harvestable castings, which can be used as potting soil. Vermicomposting also produces compost or “worm” tea, a high-quality liquid fertilizer for house plants or gardens.



Static Pile Composting

This method involves mixing the compost ingredients together and constructing a pile from the blended material. Further turnings may not be necessary. This is an effective method for composting Type 1-a residuals such as leaves. It may produce odor problems if used for wetter materials or those with higher proportion of nitrogen such as food scraps. There is a static pile operation in Lisbon, Maine.

Aerated Static Pile

This system involves building a static pile on top of an aerated system, either passive (usually with pipes and holes) or forced air. To aerate the pile, layers of loosely piled bulking agents (e.g., wood chips, shredded newspaper) are added so that air can pass from the bottom to the top of the pile. The material is not turned until the active phase of the compost process is completed. Air is either passively drawn or actively forced through the pile with fans or blowers. It has been widely used

for manure or municipal sewer residue (Type II). Careful monitoring of airflow, temperature, and moisture content is required. These piles are subject to excessive drying, which can slow the activity of the microbes. There is an aerated static pile in Wilton, Maine.

Aerated (Turned) Windrow Composting

Organic material is placed rows of long piles called “windrows” and aerated by turning the pile periodically by either manual or mechanical means. There are specialized machines for windrow turning. The ideal pile height, which is between 4 and 8 feet, allows for a pile large enough to generate sufficient heat and maintain temperatures, yet small enough to allow oxygen to flow to the windrow's core. The ideal pile width is between 14 and 16 feet. Regular, thorough turning is important to assure adequate blending of material.

The DEP compost experts maintain that is the preferred method for most on-farm and seafood composting activities. It would work equally well for a municipal system. It has the advantage of allowing a large volume of material to be composted quickly. It requires more monitoring and maintenance than static piles.

Windrow composting often requires large tracts of land, sturdy equipment, a continual supply of labor to maintain and operate the facility, and patience to experiment with various materials mixtures and turning frequencies. The windrow turning machine is expensive. There is a windrow composting facility at Lincoln County Recycling in Wiscasset.

In-Vessel Composting:

Organic materials are fed into a drum, silo, concrete-lined trench, or similar equipment where the environmental conditions-including temperature, moisture, and aeration-are closely controlled. The apparatus usually has a mechanism to

turn or agitate the material for proper aeration. In-vessel composters vary in size and capacity. In-vessel composting can process large amounts of waste without taking up as much space as the windrow method. In addition, it can accommodate virtually any type of organic waste (e.g., meat, manure, biosolids, food scraps).



In-vessel composting produces very little odor and minimal leachate. In-vessel composters are expensive and might require technical assistance to operate properly, but this method uses much less land and manual labor than windrow composting. Conversion of organic material to compost can take just a few weeks. Once the compost comes out of the vessel, however, it still requires a few more weeks or months for the microbial activity to stabilize and the pile to cool.

There are three primary types of composting vessels:

Enclosed aerated static piles

Piles are enclosed in a plastic bag, breathable fabric, ridged container or building. This keeps out moisture and controls odors. It uses mechanical aeration to control compost conditions. Materials are not agitated. Commercially available systems cost between \$35,000 and \$65,000 and have a capacity of 150 yards per batch cycle. A cycle normally consists of 21 days.

Agitated beds and vessels

This system includes horizontal concrete bays with mechanical

agitators that travel along the top, and horizontal or vertical vessels with an internal mixing device. Some systems have a conveyor belt. They combine controlled aeration with periodic mixing. Depending on capacity and design, prices range between \$10,000 and \$100,000.

Rotating drums

These are cylindrical vessels that are automatically turned on a continuous basis, usually at speeds of 1 rpm or less. They mix, grind and aerate materials to initiate composting. Costs range between \$18,000 and \$75,000. Capacity ranges from 1 yard to 2.9 yards/day capacity. One model is a mobile, electrically powered drum that continuously processes up to 100 cubic yards at a time.

ISN'T THE PERMITTING AND OVERSIGHT PROCESS COMPLEX?

Maine DEP staff is available to help with the application process. Hancock County Planning Commission staff can provide a general orientation. As mentioned above, the materials with a lower carbon to nitrogen ratio require more monitoring. The permitting process addresses odor, vector management, drainage, and setbacks.

HOW DO WE GET STARTED?

HCPC staff is available to meet with towns to assess their compost potential. The first step is to assess sources of organic material.

These could include, but are not limited to:

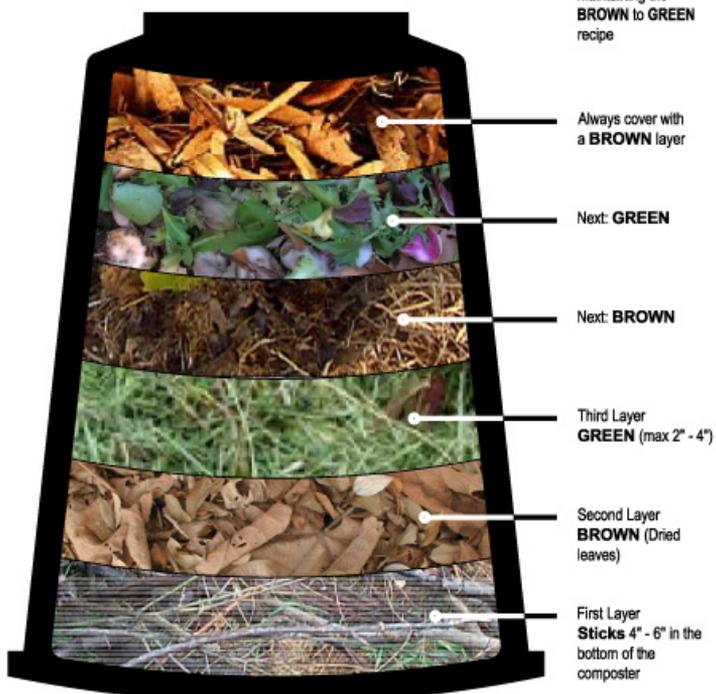
- Yard and leaf waste;
- Shellfish;
- Pre and post-consumer residential food scraps;
- Restaurants;

Food markets:
Institutions; and
Transient accommodations (hotels, campgrounds, B&Bs).

The next step is to determine how easily these various forms of material can be composted. An effective composting operation usually requires prompt delivery of the material to the composting site. Site operators need to have the capacity to manage the composting facility in a manner that complies with state regulations. We can learn from examples of successful composting elsewhere.

HCPC can help with the state permitting process and meet with potential privately owned composting facility operators to determine their interest and ability to accept various types of material. It can also arrange meetings with specialists who can share their expertise on the technical details of composting. We can also meet with major generators of organic material. Feel free to contact Tom Martin (667-7131 or tmartin@hcpcme.org) if you have any questions.

A COMPOST RECIPE TO FEED YOUR SOIL.



KEEP MOIST: As wet as a wrung out sponge.

AERATE: Air helps to speed up decomposition. Aeration should be done throughout the entire composting process.

KEEP COVERED: Use a compost lid, cardboard or canvas over top of your pile.



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For Further Information Contact:

Hancock County Planning Commission
395 State Street
Ellsworth, Maine 04605

Phone: (207) 667-7131

Fax: (207) 667-2099

E-mail: hcpc@hcpcme.org

Web site: www.hcpcme.org

Monday - Friday, 8:00 AM- 4:30 PM

After hours?

Leave a message on our answering machine.

Directions:

HCPC is located on Route 1A, 395 State Street in Ellsworth, opposite the Friends and Family Market. Look for our sign.

Our Staff

Thomas E. Martin
Jim Fisher
Sheri Walsh

Executive Director
Senior Planner
Admin. Assistant/
Planning Technician

tmartin@hcpcme.org
jfisher@hcpcme.org
swalsh@hcpcme.org