

Composting and land spreading food processing plants

Composting and land spreading are environmentally-responsible alternatives to landfilling and can be an economical way for managing food processing by-products.

Through composting and land spreading bacteria and fungi, which are naturally occurring microorganisms, decompose organic matter into a useful soil additive.

Food processing by-products, such as fruit and vegetable waste, can be composted or land spread. Liquids may be directly applied to a field using land spreading or injection.

Meat and dairy products, fat, grease and oils are unsuitable for composting or land spreading. They attract rodents and produce odors if not managed properly. Because of their high nutrient value, they are more suitable for livestock feed. For information on using these by-products as livestock feed, refer to MnTAP's fact sheet *Feeding Food Processing By-products to Livestock* [#67].

Composting

On-site composting is a good option for facilities such as canneries that do not produce enough by-products on a regular schedule for feeding to livestock. Composting organic materials must be done in a controlled environment and requires active management. Regular monitoring is needed to ensure that bacteria and fungi have the proper environment in which to function. Conditions must be monitored including temperature, moisture content, particle size, carbon to nitrogen ratio, oxygen content, and time.

The initial moisture content of products must be between 40% and 60% by weight. For liquids and by-products with higher moisture content, dry bulking agents such as hay, straw or wood chips may be added to lower the overall moisture content to within the required range.

If sufficient space is available at your production facility, consider building a compost facility. The following sections will be helpful for setting up and managing an on-site compost facility.

Permitting

Because commercial food by-products are considered an industrial waste, a permit for composting is required by the Minnesota Pollution Control Agency (MPCA). To obtain a permit application form, contact the MPCA at 651.296.6300 or 800.657.3864. The permit application must include information about the design plan, site selection, site construction, and daily management of the compost facility.

Location

Locate the compost facility on ground high enough to prevent water running onto the site after a heavy rain. Keep the compost site away from residential areas to prevent odor complaints.

Design

The design must include a gently sloped liner to help prevent liquid runoff from the compost site, leachate, from contaminating ground water. Sloping the liner will help divert water from the compost site to an area where it can be collected and properly treated. A turning device and enough room is needed to mix the compost material. Turning ensures that all materials reach the temperature (20 to 150°F) and time requirements of the MPCA permit.

Management

Once the site is operational, proper management practices must be followed including:

- Monitor daily temperatures to ensure that the proper temperature is maintained throughout the pile.
- Add liquid and bulking agents during the composting cycle when needed to maintain proper moisture and oxygen levels.
- Turn the compost pile on a regular schedule to ensure that the composting material meets time and temperature requirements.

Land spreading

Land spreading organic materials, such as food processing by-products, involves incorporating the materials into the soil where they are biologically broken down and remain in the soil as plant nutrients.

Permitting

A permit may be required for land spreading food processing by-products. To find out if a permit is necessary, contact the MPCA at 651.296.6300 or 800.657.3864. Information on nutrient content of the food by-products and proposed application rates must be included on the permit application.

Space

If sufficient land is available at your production facility, the by-products can be landspread on site. If land is not available on site, contact your county extension educator for help locating a suitable site. Or, run an ad in your local paper to directly contact interested landowners or farmers.

Applying Compost and Land spreading

Because applying compost and land spreading adds nutrients to the soil, you need to add the by-products at appropriate rates, just like any other fertilizer. For information on application rates contact the University of Minnesota Department of Soil, Water and Climate:

- Composting, Tom Halbach 612.625.3135
- Land spreading, Dr. Carl Rosen 612.625.8114

Analytical information on the soil at the land spreading site and on the food by-products may be required. If this analysis cannot be done at your facility, the Soil Testing and Research Analytical Laboratories at the University of Minnesota may be able to run the necessary tests. More information is available online by searching keyword “soil testing” at <www.extension.umn.edu>, or call 612.625.3101.



For More Information

MnTAP has a variety of technical assistance services available to help Minnesota businesses implement industry-tailored solutions that maximize resource efficiency, prevent pollution, increase energy efficiency and reduce costs. Our information resources are available online at <mntap.umn.edu>. For personal assistance call MnTAP at 612.624.1300 or 800.247.0015.