# Composting Policy

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# Contents

## Purpose

To provide recommended standard operating procedures for composting on UTD property; which is handled through the Grounds Division of the Facilities Department. All of the contents of these following procedures are of strong consultative recommendation through the Department of Environmental Health & Safety.

## What Is Composting?

Composting is the biological decomposition of organic materials by microorganisms under controlled, aerobic conditions to a relatively stable humus-like material called compost. Composting can happen in many different ways using a variety of materials, methods, equipment, and scales of operation. Composting is much more than just aging matter - it is a science that needs to be monitored for hazardous conditions. The decomposition occurs in a well-managed process to obtain specific positive results - a valuable product - with a minimum of negative environmental impacts.

As water evaporates, the carbon breaks down and is lost as carbon dioxide, the compost volume decreases and the phosphorous and most other nutrients become more concentrated. Some nitrogen will be lost during composting and some will convert from readily available forms (nitrate and ammonia) to more stable organic forms that are slowly released to crops. The nutrient value of compost can be highly variable depending on the materials being composted and the composting system used. The compost process reduces the volume to be handled and transported to a waste facility. It also concentrates many of the nutrients in the compost material compared to their concentrations in the original materials. Pathogens and weed seed viability are also reduced during the composting process. Pathogen reduction allows for the use of compost where food safety concerns are an issue. Well-managed compost reduces odors and runoff moisture to reduce potential environmental hazards.

## The Essentials of Composting

The composting process requires optimum levels of carbon, nitrogen, oxygen and water. The materials that are being turned into compost must be well mixed into the optimum ratio usable matter. The composting process must be aerobic. The particle size of these materials must allow for a good mix and maintain good airflow through the pile or windrow. Airflow is necessary to supply oxygen to the microbes that will be active in the compost and to release the carbon dioxide and other gases that are generated in the decomposition process. Hazardous mixtures are prohibited, so hazardous gases will not be trapped or released. Water is required to maintain the life functions of the microorganisms in the compost. Excess moisture will reduce the airflow and the compost will cease to be aerobic.

During the composting process, heat, water ($H_2O$), and carbon dioxide ($CO_2$) are released into the air. Ammonia should not be present as it is would be under normal composting standards.

There should also be no accumulation of methane ($CH_4$) and nitrous oxide ($N_2O$) in the piles from generated bio-waste within the pile. **NO BIO-WASTE OR FOOD WASTE IS APPROVED TO GO INTO ANY COMPOST PILE ON UTDALLAS PROPERTY**. Options to add bedding into the mix is prohibited. Fruit and vegetable wastes may need to be

mixed with other materials to balance the ratio and to bring the moisture to appropriate levels when composting. Liquid materials cannot be composted alone but can be blended with dry materials before composting to obtain optimum moisture content range. Do not add liquid materials such as manure since that would introduce potential pathogens into the compost; which is considered a biological waste action. The choice of input materials for composting may depend on the final use of the compost. The materials used will influence the nutrient analysis of the mature compost product. Run-off should be tested and kept un-contaminated with drainable constituents, like nitrates from fresh grass clippings.

## Identification of Waste Sources

The sources for production of organic matter are:

- Landscape/Grounds waste
- Agricultural/ Wood waste

**Landscape and grounds waste** cover a large area of organic matter. Whether you attend a rural or urban college, trees, shrubs, and lawns are present in one form or another. Some examples of landscape wastes include fallen leaves, grass clippings (nitrate producing), and herbaceous pruning.

**Agricultural and wood wastes** are often large sources of organic matter on campus. Agricultural waste may include baled straw (rotten), bedding, unused harvests for research purposes (tomato yield research, fruit harvest research), agricultural processing plants (grape pumice, cotton gin trash, rice hulls, etc…), or greenhouse matter. Another source of organic matter is wood shavings, chipped woody matter, and even old wood pallets which are not recommended because of time length for decomposition.

**Any source allowed to go into a compost pile will not have been sprayed or contaminated with pesticides or other hazardous chemicals with 24 hours of blending within a compost pile.**

## Types of composting systems

*MECHANICALLY AERATED WINDROW* is a system whereby compostable materials are layered into elongated piles or rows, which are then periodically mechanically turned. Access to either a front loader tractor or a compost turner attachment is necessary for larger projects. Piles are usually 8-10ft at the base of the pile and 4 feet high. It is recommended that mechanically aerated piles be turned 5 times in 15 days to insure that the each part of the pile reaches decent temperatures for pathogen reduction. Piles can go from raw materials to finished compost in less than two months with proper turning schedule. Once again, an area with good drainage or a pad is needed for this form of composting, space is the limiting factor. Requirements are similar to the static pile except a tractor of some sort is needed.

*IN-VESSEL COMPOSTING* is a system by which compostable material is enclosed in a drum, silo, agitated bay or some other structure where environmental conditions are closely monitored and controlled. The contents are usually turned mechanically within the enclosed structure. These systems are great for urban schools, where space if very limited and odor may be an issue. The system often needs a small concrete bad and an electrical outlet. Since the

system is enclosed bulking agents such as wood chips and cardboard boxes (often waxed-non-recyclable) can be used as carbon source to compost the wet food waste.

## Pile building

**This** is an art form assuming you are doing some type of windrow system. Some piles are built all at one time, while others are constructed on a daily basis using a layering technique. Some piles are food waste and animal bedding, and others may include manure. Two systems that will be described are the daily static pile and the all in one pile.

- DAILY- The daily pile is a static pile, which is constructed on a daily basis. A thick layer is placed directly on the ground alongside a road. The bidding is about 10ft and the length reaches about 50ft, but can be extended depending on volume produced. Each day 15ft portion of the pile is opened (dependant on amount of food waste) by scraping the surface layer of straw to the edges of the pile, thereby creating walls on each side of the pile and a basin in the center. The bins are dumped in this basin and spread throughout the exposed area. Bedding is then applied over the basin and the process starts over. This layering may rotate throughout the pile weekly or daily. After the pile reaches heights of 4-5 ft, it is turned mechanically either by a front loader or a turner. The pile can be mixed daily via a pitch fork to stratify the layers.

- ALL IN ONE- This involves feeding the food waste into a manure spreader along with the proper amount of bedding. The contents are mixed as they are spit of the shredder, a front loader then form the piles. Some variations include storing the food waste in a large roll of containers and then building the pile all at once.

For any assistance with further standards or procedures and limitations about composts at UTD, please contact the Department of Environmental Health and Safety.