

## Environmental Benefits of Composting

Composting is the controlled decomposition of organic material to generate a stable organic product which can be utilized as a soil amendment and provide plant nutrients. Composting prevents methane production by allowing food scraps to decompose aerobically in a compost pile, as opposed to decomposing anaerobically in a landfill. In addition, composting processes food waste into a valuable product which can be used as a soil amendment in a variety of settings, including in green infrastructure and stormwater management, ecosystem conservation and restoration, contaminated site remediation, horticulture and landscaping, and agriculture. Compost adds organic materials to soil which increases the productivity of agricultural land, aids plant growth, conserves and filters water, improves soil stability and prevents soil erosion and nutrient runoff.



*Compost Your Food Scraps for a Healthier Planet*

In addition to these environmental benefits, research from the Institute for Local Self-Reliance indicates that compost operations also provide economic benefits to communities, supporting more jobs on a per ton basis than landfills or incinerators.<sup>1</sup>

<sup>1</sup> <https://ilsr.org/wp-content/uploads/2014/07/state-of-composting-in-us.pdf>

### Methods of Composting

There are multiple methods and scales of composting. While the techniques and size of operations vary, the basic principles and components of composting remain the same. Composting breaks down organic material through the process of decomposition. Compost requires a mix of carbon and nitrogen rich materials, inputs that are often referred to as feedstocks. Carbon rich materials are often referred to as the “browns” of compost and include materials like dry leaves or sawdust. The nitrogen rich material is typically food scraps and is referred to as the “greens” of compost. While specific ratios can vary, most compost requires three parts brown to one part green. Bulking agents, such as woodchips are sometimes added to assist with maintaining aerobic conditions. Moisture content, oxygen flow, and temperature are all important considerations in proper compost production. Compost piles must remain at a high temperature for several days in order to be considered stable. This high temperature ensures that any pathogens are killed.<sup>2</sup>

### Scales of Composting

#### Industrial/Centralized Composting

Large-scale composting facilities are designed to process high volumes of organic materials and often service residential programs, commercial collectors, and other large institutions. These facilities often have more ability to process a wider range of compostable materials, including meat, dairy products, and compostable packaging. Compost collection guidelines vary from facility to facility and should be verified before any collection begins. Many facilities will only accept compostable material that have met standards of a third-party certification. Finished compost from large scale compost facilities is often sold in bulk quantities to the agricultural sector.

#### Community Composting<sup>3</sup>

Community composting often takes place at the neighborhood level, often operating in connection with a school, community garden, or another group in the community. Community composting has social, environmental, and economic benefits for participating communities. It is often cheaper and less resource intensive to set up than other composting methods.<sup>4</sup> Compost created at the community level is often used locally, helping to strengthen local soil and support the local food system.

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<sup>2</sup> <https://www.epa.gov/sustainable-management-food/approaches-composting>

<sup>3</sup> <https://www.epa.gov/sustainable-management-food/community-composting>

<sup>4</sup> <https://www.epa.gov/sustainable-management-food/community-composting>



*Cycle of Community Composting (EPA)*

## Backyard Composting

Backyard composting, also known as home composting, occurs in residential settings and typically involves a pile, or a small, enclosed bin to break down household food scraps. Finished compost can be used as a soil amendment for home gardens or house plants. Home composters typically process fruit and vegetable scraps and yard trimmings.

## Composting Methods<sup>5</sup>

### Windrow

Windrow composting is the most common composting method used by large commercial operations in the U.S. Organic material is added to long narrow piles called windrows. These piles are roughly twice as wide as they are high. In order to ensure that oxygen is available in the compost piles, the windrows are occasionally turned, requiring equipment such as an excavator or windrow turner. This method can be used to process large quantities of compostable material.



*Windrows of composting being turned at Royal Oak Farm, LLC in Evington, Virginia*



*Windrow composting at Royal Oak Farm, LLC in Evington, Virginia*

<sup>5</sup> <https://www.epa.gov/sustainable-management-food/approaches-composting>



## Static Pile

Aerated static pile composting can process a wide range of materials and is often faster than other composting methods. In this process, compost is placed in bins that are equipped with piping systems that provide oxygen to the pile, enhancing the decomposition process.

Static pile composting that does not use active aeration is referred to as the bin method and is typically used by home or community composters. This method sometimes produces what is known as the “chimney effect,” which is caused by passive aeration, as warm air moves to the top of the pile, cool air is drawn in through the sides and bottom of the pile. Bin composting systems typically do not get hot enough to break down meat, bones, or dairy products. Turning this compost can also aid in its decomposition.

## In-Vessel

Several machines and pieces of equipment are available that allow for in-vessel composting. Compost materials are placed into the vessel and then mechanically turned or mixed with materials such as wood chips which help the compost stay aerated.

## Vermicompost

Vermicomposting, also referred to as worm composting, uses certain species of earthworms to break down organic material. Vermicomposting produces worm castings that, like traditional compost, can be used as a soil amendment. Worm bins need to have proper air flow, a means of draining excess liquid, and should be shielded from sunlight and rain.