

Composting

Texas A&M Extension Service

Introduction

Today, solid waste management is one of the most prominent environmental issues facing Texas and many other states throughout the nation. Our landfills are filling up at an alarming rate.

Organic landscape materials, including leaves, woody trimmings and grass clippings often contribute significantly to a communities' annual solid waste. During peak leafdrop in fall when residents are bagging and placing leaves curbside, organic materials may account for as much as 50% of the incoming landfill volume.

The irony is that, with the exception of large woody brush, residents can recycle all their organic materials right in their own yards through composting, mulching and grasscycling. By recycling these materials, we're not just saving our landfill space but also improving our home environment. Organic matter adds valuable nutrients back to the soil, improves the condition of our soils, helps insulate the soil from temperature extremes, and helps plants survive dry periods by holding moisture in our soils.

As concerned citizens and good stewards of the environment, it's time to take action and stop throwing out what we can recycle and reuse. It's time we stopped classifying organic materials as waste and see them as Mother Nature intended...an important link in the web of life, whose death and decay brings newness of life and beauty to our environment.

What is Compost?

Compost is the controlled decomposition of organic matter through biological processes, with the end result being a nutrient-rich humus. The word 'compost' is derived from the Latin verb componere which means to put together. Composting involves the putting together of a mixture of vegetable residue, animal matter, soil and water to form humus. Just as variety is the spice of life, a variety of different organic materials makes the best compost.

Why Compost?

Composting is one way we can manage and recycle our organic landscape materials and manufacturing humus for improving our soils. Composting will also reduce the volume of organic materials by about 80% as they decay. Every resident who has a landscape should also be composting organic materials. It may be done as simply as piling organic materials in an out-of-the-way place in the backyard and letting them rot on their own. Or you may want to build or purchase a compost bin that will accelerate the composting process. Compost will improve the productivity of your soil and the growth of plants in your landscape and garden.

Composting is the cornerstone of waste source reduction. Source reduction means putting less stuff on the curb for the garbage man to pick up and deliver to the landfill.

An Age-Old Practice

As a natural process, “composting” has been taking place since the initiation of plant life on earth. Early man no doubt learned to use manures and planted in soil enriched by natural decay. Historians have traced composting and the use of compost in Europe to the Roman Marcus Cato over 2000 years ago.

The first important advance in the practice of composting was made by Sir Albert Howard almost 75 years ago in India. He systemized the traditional procedure into a composting method he called the Indore process. This process involved stacking alternate layers of animal manure, sewage sludge, garbage, organic matter, such as straw, leaves, and municipal refuse. The material was stacked to a height of about 5 feet or was placed in specially constructed pits 2 to 3 feet deep. The original procedure called for turning the material only twice during the composting period of six months or longer. The liquid draining from the decomposing mass was recirculated to moisten the pile or was added to other drier piles. The Indore process, named after the locality in India, with modifications and improvements, has been widely used in many different countries. An important innovation has been more frequent turning to maintain aerobic conditions, thus providing more rapid decomposition and shortening the composting period.

During the period 1926-1941, Waksman and his associates carried out fundamental research on the aerobic decomposition of vegetable residues and stable manures. They made and reported important discoveries regarding the influence of temperature on the rate of decomposition, the role of individual groups of micro-organisms, and the effect of mixed cultures compared with pure cultures on organic breakdown.

From 1950 to 1952, Gotaas and his associates conducted research on some of the basic aspects of composting mixed municipal refuse containing garbage and sewage sludge. Their investigation provided basic information on the effects of some of the different variables encountered in aerobic composting, namely: (1) temperature; (2) moisture; (3) aeration by turning and by other means; (4) the C:N ratio of the organic materials; (5) the use of special biological inocula; and (6) grinding or shredding the material.

Their studies also yielded data on the types of organisms present in composting techniques for judging the condition of the compost at various stages of decomposition.

While composting practices were being refined in India, China, Malaya, and elsewhere, other investigators, notably in Europe, were devoting considerable effort to mechanizing the composting process, particularly for use as a method for treatment and sanitary disposal of the garbage and refuse from cities. These efforts resulted in various mechanical innovations, usually with the objective of improving the aesthetics of the process by enclosing the materials in some type of structure, of speeding it up, and of making it more economical. The mechanized and enclosed processes are primarily designed for cities, but they are also valuable in rural village composting. Various modifications of the Indore process have been used in the Netherlands, Germany, Austria, England, Africa, Australia, New Zealand, India, Malaya, Central America, and the USA.

Composting as “Micro-Farming”

Composting is simply micro-organism farming. A good farmer keeps in mind the basics of soil, season, pests, and climate when growing a crop, and a good composter must focus on the materials being composted (their size, freshness, exposed surface) and the climate around these materials (moisture, aeration and temperature) to ensure a healthy compost crop. Fortunately, as composters we can do much more to control the climate in a backyard compost pile than a farmer can do to control the weather. The micro-organism farmer who keeps in mind some basic rules of thumb can cultivate good compost in any climate.

Anything organic - leaves on the ground, a fallen tree, or a wood framed house - will decompose. The

more resistant the material is to decay, however, the longer the process will take. Except in some special situations, decomposition is inevitable! A total absence of air, such as in a peat bog, will prevent decomposition. In very dry places or in very cold climates decomposition may be slowed or stopped. Everything organic that's out in the weather will sooner or later be fueling the decomposition process.

The materials you need to begin your micro-organism farming venture are the very same ones falling on your yard, grass clippings from your lawn, sod stripped for a garden, weeds, squash vines, watermelon rinds, coffee grounds, tea leaves and fruit and vegetable trimmings from the kitchen -- all these materials come from once living organisms and can all be composted in some manner. So start right in your yard with the materials at hand and find ways to use what you have.

A diversity of materials is the key to a really first-rate compost. In addition to the major plant nutrients such as nitrogen, phosphorus, and potassium, plants take up a host of minor elements and trace elements. The more diverse the materials composted, the more likely that these elements are returned to the plants. This is not to say the materials will compost better, only that they will feed the plants better.

Where are materials for composting found? Well, an avid recycler of organic wastes looks longingly at the contents of supermarket dumpsters and florist shop trash barrels. These are items that would otherwise be thrown away. The quote below from Vic Sussman's book *Easy Composting* (pp. 103-4), sums up the situation:

“...gardeners can serve an important role in collecting such ‘wastes’ that might otherwise plague the community and the local environment by ending up as pollutants. But besides lifting a small part of the burden off your fellow taxpayers, you’ll be functioning as an agent of change. People will express surprise and curiosity at your collection and composting of what they had previously considered useless stuff. Your recycling and humus making will act as a reminder that garbage and organic trash are really resources, not problems, if we use our collective imaginations and practice self-reliance.”

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