Compost Preparation

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Nature of compost
A compost is made up of one or more organic materials that have been piled, with or without added soil, and allowed to decompose until the product breaks up readily, can be easily worked into the soil, or can be used as a potting mixture. Organic residues most utilized include leaves, lawn clippings, garden wastes, and animal manures. Because tree trimmings and woody plant stems decay slowly, they should first be chopped or chipped and then composted separately or mixed with other residues. Corn stalks and similar residues should also be chopped before piling. Some detrimental microbes and weed seeds may survive the composting process, so discard diseased plant materials and weeds that have gone to seed.

Value of compost
Composts contain plant nutrient elements that are released slowly during further decomposition of the organic residues in the soil. Nitrogen is probably the most important of these elements. Composts also improve the physical condition of soils by reducing surface crusting, aiding water infiltration and plant root penetration, and improving soil aeration. Although good plant growth can be maintained by using inorganic or organic fertilizers alone, best results are often achieved with a combination of inorganic fertilizers and organic residues applied to the soil.

Composting is probably best suited to the home gardener. The full-time farmer may find it more economical and convenient to supply organic matter to the soil in the form of crop residues, animal manures, cover crops, or grass in rotation. Compost may be available commercially in some areas.

The process of decay
The piled organic materials decompose primarily through the action of bacteria, fungi, and other soil organisms. Crop waste, soil, and dust contain the needed forms which establish themselves quickly under proper conditions for composting. These organisms function more effectively at favorable temperatures, with proper air and moisture, and in the presence of adequate supplies of nutrient elements, especially nitrogen. During decay, excess carbon evolves as carbon dioxide, and nitrogen and other plant nutrient elements become concentrated. The plant materials gradually turn dark brown to almost black and lose their original structure. Microbial inoculations and other "special preparations" are not necessary for a good product.

Time required
The time required for composting depends upon the materials used and environmental conditions. Fresh, succulent plant residues may decompose in 3 to 6 weeks. More mature and partially dried residues will probably require 2 to 4 months and small-diameter or chipped woody materials a year or longer. Composting is adequate when the product is dark brown, breaks up readily, and contains about 1.5 to 2 percent nitrogen. At this stage sufficient nitrogen is present to satisfy microbial requirements, and ammonia nitrogen is released upon further decomposition in the pile or in the soil. If a high cellulose and low-nitrogen compost is applied to soil before adequate decay has occurred, microbes that further decompose material in the soil compete temporarily with the plants for available nitrogen and other nutrients. If composting is prolonged beyond the completion point, some nitrogen is lost through volatilization or leaching, and the beneficial influence of the product on soil physical properties will be reduced. It may not be convenient to use the compost at precisely the optimum stage of decay. Many home gardeners prefer to add residues to the pile as they become available during the summer and fall, then compost during the winter and apply the finished product to soil in early spring.

Location of compost
The compost pile should be placed in a convenient, secluded location. It can usually be hidden by shrubbery or a building. It is advantageous to compost the plant residues in an open pit, a cement-lined pit, or a covered cement construction that can be opened at the top or the top and one side. Wooden boxes are less desirable because they rot quickly. If wooden boxes are used, redwood is the best type.
Constructing the pile
Residues may be mixed before piling or may be added to the pile as they become available. Compact dry and loose materials and adequately moisten each 6-inch layer. To hasten decomposition or improve the fertilizer value of the finished product, spread about 1 pound of ammonium sulfate or other nitrogenous fertilizer and about half as much superphosphate over each 20 square feet of surface. In acid soil areas, lime (1 pound per 20 square feet of compost) is beneficial. High-nutrient organic materials, like chicken manure, blood meal, or completed compost, may be used in place of inorganic fertilizer. Use 6 to 10 pounds of chicken manure or completed compost for each 20 square feet of surface.

Depending on the supply of residues at hand, additional layers may be added to the pile. The top should be kept flat so that when water is applied it enters the pile rather than running off the edges. Do not keep the pile saturated or soggy wet. This will slow the decay process and produce objectionable odors. Use of large quantities of highly succulent plant residues or high-protein wastes may also cause temporary foul odors. Covering the pile with a layer of leaves, wood shavings, or similar bulky materials (or a thin layer of soil) will reduce odors.

It is sometimes suggested that a 1- or 2-inch layer of soil be applied to each 6-inch layer of residue to accelerate decay, but this increases the work of constructing the pile and handling the compost, and the product is less effective in improving soil's physical properties. If desired, soil may be added when the finished product is to be used directly for potting or to fill larger plant growth containers.

Turn or mix the compost pile two or three times to speed decay by improving aeration within the pile and to correct under- or over-watering. During the turning, return materials near the edges and on top to the middle of the pile. Also turn and mix the pile after new residue additions have been made. If necessary, the completed compost may be screened to obtain a relatively uniform product that can be handled and spread easily. The compost can be worked into the soil, used as a mulch, or used in a potting mixture.