



Composting

Compost is a mixture of soil and decayed organic matter or humus that is used to improve garden and potting soil. Properly prepared compost is free from weed seeds and offensive odors and rich in nutrients that plants need. It may be applied as a mulch or mixed into the soil in vegetable gardens. Compost is produced in piles or pits from organic waste such as leaves, grass clippings, manures, straw, hay, and garden refuse.

One of the greatest benefits of making compost is that it allows us to recycle garden and yard waste into a valuable, usable product, reducing the amount of solid waste going into landfills. Converting your garden, fruit, and vegetable wastes to compost is something you can do to improve the environment. Neighborhood composting facilities or shared family compost piles are options. Composting small prunings and twigs and encouraging municipalities to shred large prunings and downed limbs allows reuse of damaged or overgrown plants in the landscape.

Chemistry of Compost

The conversion of organic wastes to rich humus involves several types of bacteria and fungi. Bacteria begin the process of breaking down sugars, proteins and other complex molecules in the residue. Bacteria increase rapidly in a new compost pile. The temperature inside the pile may rise to 150–160°F, inactivating weed seeds and harmful disease organisms.

As residue is decomposed, temperature decreases, fungi disappear, and millions of bacteria continue gradual breakdown of organic materials into rich, dark, crumbly humus. In regions with acid soils, wood ashes or limestone may hasten decay and prevent excess acidity and sourness.

Getting Started

Locate the compost heap in an area where water will not stand. Many gardeners use an out-of-the-way, accessible location near the garden or refuse disposal site for convenience.

The compost may be made using a below-ground pit or an above-ground method that does not require laborious digging. Although it is possible to simply accumulate the compost in a loose pile, an enclosure of some type is desirable. Several materials can be used for this purpose.

Woven wire or wood slat fence.

Various types of woven wire are available—from reinforcing wire to fencing wire. Heavy

gauge wire that is self-supporting is preferable; however, finer wire supported by rods or posts could be used. Lining the fence with a layer of plastic will speed decomposition by retaining moisture necessary for microbial activity. In order to maintain adequate drainage and aeration, do not line the bottom.

Cement blocks or bricks. Mortar is not necessary because the weight of the blocks will hold the pile in place.

Scrap lumber. Don't use good lumber because the damp compost may ruin the boards. If a permanent enclosure is desired, use redwood or cypress. Old pallets frequently can be obtained free of charge, and strapping four or five of these together to form a cube makes an excellent compost bin.

The size of a compost pile varies, depending on the quantity of organic material available and the amount of compost needed. Rectangular or square shapes may be slightly easier to work with than round ones. Round enclosures made of wire bent into a cylinder have the least amount of surface area to dry out and work well. Either shape can be used successfully. For most households, a pile 5 feet wide by 5 feet long or a circular pile about 5 feet in diameter is sufficient. The height of the pile will fluctuate as organic material is added. If you have a lot of yard materials to compost, it is a good idea to have two or three piles or bins, one for the finished compost from last year, and the others for this year's fresh material.

Several kinds of plant materials can be used in the compost pile. These include leaves,

grass clippings, weeds, garden refuse, fine hedge clippings, straw, corn cobs, cold wood ashes, sawdust, old unusable hay, and mulch raked from around flower or vegetable gardens. Avoid using severely diseased vegetable or flower plants. Kitchen scraps such as egg shells, peelings, or plant residues can be added to the pile if covered to prevent flies, but avoid using meat scraps or bones that may attract dogs or other animals.

Making the Compost Pile

Start with a layer of soil or sand 2–3 inches deep on the bottom. Then add a layer of organic materials. For fine materials such as thin grass clippings use only a 2- to 3-inch layer; for coarser materials such as straw, use 6- to 8-inch layers. To hasten decomposition, add a small quantity of commercial garden fertilizer—1–2 cups per square yard of area. You may substitute an inch or two of manure. The purpose of the fertilizer or manure is to provide a source of nutrients for microorganisms that must build up in the compost pile to ensure decomposition.

Repeat this sequence of soil or sand, organic materials, and fertilizer in layers as organic materials become available. Water each layer as it is added.

The top of the compost pile should be dish-shaped or slightly lower in the center than on the sides. This allows rainfall to soak into the pile rather than run off. Because of extremely high temperatures generated by the composting process, a dry compost pile oxidizes too rapidly and the overheated, feathery compost



A three compartment composter is easy to construct. The cover keeps things looking neat. Removable front boards allow access for turning and removing compost.

that results is of little value. In dry weather, a weekly soaking of the pile is desirable to keep it sufficiently moist.

The rate of decomposition can be hastened by turning the pile — slicing through the layers and turning them upside down. This action is similar to spading garden soil when it is turned over. This mixing should be followed by reforming the “dish” at the top of the pile and watering. Compost should be ready to use 4–6 months after starting the pile, but most gardeners prefer to keep two piles or one pile divided into two sections. Materials can be accumulated in one while last year’s finished compost is available for use from the other.

As your compost pile progresses, these signs will indicate whether all is going well:

- In 2–3 weeks, the pile should shrink or sink. If it has not, loosen the pile with a shovel or fork to provide more aeration, or add moisture if the compost is dry.
- Check for a strong ammonia or offensive odor. This may be caused by overwatering, or an imbalance of materials. Aerate as above. Ammonia odors often come from composting a lot of fresh, green plant material, especially grass clippings.
- After 4–5 weeks, or less than a week for “quick composting,” it should be hot deep within the pile. Push a wire or stick deep into the pile, pull it out and touch it to check temperature.
- In 3–4 months, the pile should be about half its original height. The compost will be dark, moist and crumbly. It should have the odor of moldy leaves or a rich earthy odor.

Quick Composting

In recent years, the emphasis has been on quick composting. Materials are finely shredded, premixed with soil and fertilizer, moistened, and placed in an enclosed bag or bin. The resulting compost—in a month or so rather than 4–6 months—is comparable in quality to that of slow composting. It does, however, require slightly more effort.

Several commercial bins can be purchased for use in quick composting processes, and each comes with operating instructions.

You can use containers such as plastic bags or garbage cans for the same purpose. Sheet plastic and a standard enclosure work as well. Begin by lining the enclosure with sheet plastic. Next, finely shred the organic material with a soil shredder, compost grinder, or coarse hammermill. These devices are costly for most gardeners, but the serious gardener may find



A wire container used to accumulate yard waste, which will slowly decompose over time. Not everyone builds a perfect compost pile.

them useful. For those who do not wish to purchase a grinder or shredder, a rotary lawn mower can be used to pulverize or shred leaves and prunings. For mowers with bagging attachments, collect the organic materials in the bag. With discharge mowers, blow shredded materials into a central pile by turning in a circle.

Mix and add shredded organic materials, soil, and fertilizer or manure in proportions similar to those used for the slow composting method. It is not necessary to turn the pile. It should be ready for use in 2–3 weeks in warm weather or 5–6 weeks in cooler weather. The compost may be stored for longer periods if not needed immediately.

Grass Clippings

A common waste, clippings caught in grass-catcher attachments on lawn mowers comprise a large part of yard wastes and are excellent material for use in compost piles. However, recent research indicates it is beneficial to leave clippings from regularly mowed lawns spread over the lawn or mulched into it. Unless you are intent on collecting clippings to add to your compost pile, allow grass clippings to fall back onto the lawn.

Using Compost

Many gardeners follow the steps to make compost without understanding how compost can be used around the home. Compost can be beneficial in a variety of horticultural applications.

Soil improvement and fertilization.

Addition of organic material improves looseness and workability of soil. Heavy, tight clay soils benefit from the loosening effects of organic materials. But sandy soils benefit as well from the improved water-holding capacity and fertility that organic materials provide.

Compost also contains nutrients that plants require. While the specific nutrient content of compost varies with the type of materials composted and the amount of water in it, a general recommendation is to apply compost at the rate of 50–100 pounds per 100 square feet. This generally is translated to 1–2 bushels of material for every 10-foot by 10-foot area of the garden. The best time for applying compost is just before tillage—either in the spring or fall. Tilling incorporates the compost throughout the plant root zone. Many Kansans till garden soils in the fall, and compost made early in the season should be ready for use by then. If you have a two-pile system, compost from last year can be used.

Compost at planting. A band of compost in the bottom of a row trench or several shovels full in the bottom of planting holes can be added and mixed with the soil. This is especially beneficial for tomato plants. The slow nutrient release of compost works through the early growth period. Compost can also be used as a top dressing over the row to prevent crusting of soil for seeded vegetables. Compost can be mixed with water to form a substitute for soluble fertilizers or starter solutions. As a rule, mix equal parts of compost and water. The leftover compost can be added to garden soil later.



Mixing compost into the soil at planting time.

Mulching. One of the most beneficial practices for summer gardening in Kansas is using mulch. Mulches hold moisture in the soil, prevent weed growth, and reduce soil crusting and splashing. Mulches also help to keep the soil cooler during hot weather. A layer of compost 2–3 inches thick along the row of garden vegetables and flowers or spread around perennial flowers, trees, and shrubs reduces moisture fluctuations and evaporation of water from the soil surface. After the garden season, simply till the mulch into the soil as a source of organic material.

Potting mix for seedlings. Compost that has been screened for large particles can be mixed with soil or sand—in about equal parts—and used as a plant growing medium. The compost must be well deteriorated and free of harmful disease organisms and insects to ensure healthy seedling plants.

Cautions in Using Compost

It is important to understand that compost is not a cure-all for garden soils or concerns. The benefits of composting certainly outweigh the limits, but it is possible to overdo applications of compost.

Some composts may provide too much of a nutrient if applications are excessive. Lush, rapid growth—often at the expense of good fruit production—can occur. Compost that is not completely decomposed may continue the process of decomposition when added to soil in large amounts, removing or tying up soil nutrients until decomposition slows. This is a particular concern with compost applied in spring and when it is incorporated into the soil.

Creating a dark, cool environment at the soil surface may provide an ideal area for certain types of insects such as sowbugs or squash bugs. Specific control measures for each of these insects might be necessary. Consult your local K-State Research and Extension agent or garden center professional for information about control measures.

Some types of compost applied to the soil surface can pack into a dense layer that may be almost impervious to water. This is frequently an indication of poorly made compost. Using more soil with the compost or mixing soil with compost prior to use can correct this situation.