Coastal Waccamaw
Stormwater Education Consortium
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What Can You Do to Improve the Quality of Stormwater and Protect Your Local Waterways?

Compost Yard Waste!

THE ISSUES

Many homeowners spend vast amounts of time and money looking for chemical solutions to their landscaping needs, especially when it comes to soil amendments and fertilizers. The addition of chemicals to yards threatens nearby waterways when these chemicals runoff. Another impact of landscaping is the generation of yard waste, such as leaves, sticks, and grass clippings. Yard debris that is allowed to blow away into storm drains can impair downstream water quality because as these materials decay in water, oxygen is consumed and nutrients are released which can lead to algal blooms and low oxygen conditions that threaten aquatic life (see “Minimize Fertilizer Use” Fact Sheet). Many homeowners responsibly bag these materials and place them at the curb for municipal pick up. However, tons of these materials make their way to landfills annually, taking up valuable room and wasting the opportunity to return the organic products and their nutrients to homeowner yards.

However, by using microorganisms to convert excess plant matter into a useable soil amendment, homeowners can reduce the need to purchase expensive fertilizers and top soil, and can diminish their impacts to freshwater resources. This is done through composting, which is an excellent way to recycle organic yard debris and kitchen scraps, as well as create a high quality product for your yard.

WHAT CAN YOU DO?

Starting a compost pile in your back yard is a great way to reduce the amount of biodegradable material that makes its way into local landfills or blows into storm drains, and can reduce the time, money, and impacts on water quality that result from the need for chemical fertilizers and soil amendments. This fact sheet will walk you through the process of how composting works and how to get your own compost pile started.

What Exactly is Composting? Composting is controlling the natural decay of organic matter by providing the right conditions for microorganisms to convert yard trimmings and kitchen scraps into a product that can be returned to your landscape and garden. Tiny organisms (mainly bacteria, fungi and protozoa) break down garden organic materials in a moist, aerobic (oxygen-demanding) environment. The final product is a dark, crumbly form of decomposed organic matter, which can be used to improve soil. When added to soil, compost breaks up heavy clay soils, helps sandy soils retain water and nutrients, and releases essential nutrients. Compost also contains beneficial microscopic organisms that build up the soil and make nutrients available to plants.

What Materials Can I Compost? Most plant material can be used for compost. Organic trimmings in your landscape, such as fallen leaves, pine needles, grass clippings, flowers and the remains of garden and house plants make excellent compost. Compost made from grass clippings treated with herbicides and pesticides is not recommended for use in vegetable gardens. Kitchen scraps, such as fruit and vegetable peels and trimmings, crushed eggshells, tea bags, and coffee grounds and filters can also be composted. Woody yard trimmings can be run through a shredder before adding to the compost pile.

What Materials Should I Avoid Adding to My Compost Pile? Organic materials that should not be added to your compost pile include meat, bones and fatty foods (such as cheese, salad dressing and leftover cooking oil). Do not add pet or human wastes to a compost pile.

Weeds that have not gone to seed can be added to the compost pile. Weeds with large storage roots like nutsedge, Florida betony or greenbriar should be left out
and dried in the sun before composting to reduce their chances of survival.

The high levels of heat produced in the center of the compost pile can kill many pests, such as weeds with seeds and diseased or insect-infested plants. However, it is very difficult to mix the contents thoroughly enough to bring all the wastes to the center, so some disease organisms may be returned to the garden with the compost. Therefore, if you intend to reuse your compost in your garden, you should avoid placing diseased plant scraps in your compost pile.

"Essentials" of Composting. Organic materials for composting all contain nutrients that provide energy and growth for microorganisms. These organic materials each have their own ratio of carbon to nitrogen (C:N) in their tissues (Table 1). These C:N ratios are important because the tiny decomposers need about 1 part of nitrogen for every 30 parts of carbon in the organic material. If the ratio is greater than 30:1, nitrogen will be lacking and materials will decompose more slowly.

Leaves, straw and sawdust are high in carbon, while grass clippings, manure and vegetable scraps are higher in nitrogen. It helps to think of these materials as greens and browns. Greens, such as grass clippings, are high in nitrogen. Browns, such as leaves or sawdust, contain high amounts of carbon.

Be aware that anything organic will decay (as long as it is organic, the critters will eat it); however, it may take a long time to make compost when the C:N ratio is too high. For example, a pile made solely of sawdust will take years to decay. Adding more greens, such as grass clippings or vegetable scraps, will speed up decay and produce compost in less time. Experiment to find the right combination of materials for your compost pile.

**Surface Area and Size of the Compost Pile:** The more surface area the microorganisms have to work on, the faster the materials will decompose. You can increase the surface area of your yard trimmings by chopping them up with a shovel or running them through a shredding machine or lawnmower.

A large compost pile will insulate itself and hold in the heat created by the tiny organisms. Piles smaller than 3 feet x 3 feet x 3 feet have trouble holding this heat, while piles larger than 5 feet x 5 feet x 5 feet prevent enough air from reaching the center of the pile and the microbes. In addition, turning a large pile is a chore. If your pile is large, you will have to turn it more often. If the pile is small, you will get a good batch of compost during warm months.

**Moisture and Aeration:** The microbes in your compost pile need a certain amount of water and air to survive. Microbes function best when the materials are about as moist as a wrung-out sponge and are provided with plenty of air. Too much moisture will force out the air and suffocate the microorganisms. Too little moisture will slow down decay. Whenever you add water, be sure to mix the material to distribute the moisture evenly.

Turning the materials in your pile supplies oxygen to the composting critters. A lack of oxygen in a compost pile can lead to an odor problem due to the production of ammonia and methane gases. Decomposition without oxygen also causes the production of chemical compounds that are toxic to plants. Organic matter that has been allowed to decompose without oxygen (for example, "composting" in closed garbage bags)

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**Table 1:** Average Carbon to Nitrogen ratios for organic materials.

<table>
<thead>
<tr>
<th>Greens:</th>
<th>Browns:</th>
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<tbody>
<tr>
<td>Pig manure 5-7:1</td>
<td>Leaves 30-80:1</td>
</tr>
<tr>
<td>Coffee grounds 20:1</td>
<td>Cornstalks 60:1</td>
</tr>
<tr>
<td>Vegetable scraps 12-20:1</td>
<td>Straw 40-100:1</td>
</tr>
<tr>
<td>Grass clippings 12-25:1</td>
<td>Bark 100-130:1</td>
</tr>
<tr>
<td>Cow manure 20:1</td>
<td>Paper 150-200:1</td>
</tr>
<tr>
<td>Poultry manure (fresh) 10:1</td>
<td>Sawdust 400:1</td>
</tr>
<tr>
<td>Horse manure 25:1</td>
<td>Wood chips 800:1</td>
</tr>
<tr>
<td>Alfalfa / sweet clover hay 12:1</td>
<td></td>
</tr>
<tr>
<td>Poultry manure w/litter 13-18:1</td>
<td></td>
</tr>
<tr>
<td>Horse manure w/ litter 30-60:1</td>
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</table>
should be exposed to air for several days to complete the composting process and to destroy any plant-toxic compounds.

**Temperature and Time:** As a result of the decomposition process, the interior temperature of the pile should peak between 90 and 140 °F or higher. A hot-bed (or long-stemmed) thermometer can be used to check the interior temperature of the pile at least 12 inches from the surface. The intensity of the process depends on the amount of nitrogen in the materials. The time required to produce compost depends on the kind and coarseness of the materials, volume of the pile, and availability of moisture and air. It can take a month, a year or longer.

**"Fast" Compost Method:** This method can produce compost in a couple of months or less but is labor intensive and requires frequent turning. Start your pile with a layer of browns, and then add a layer of greens. If the greens are not fresh, sprinkle in some blood meal or cottonseed meal, poultry manure, or other nitrogen source. Mix well and add water if necessary to moisten. Adding a layer of garden soil, old compost or manure to each brown-green layer will introduce more critters to speed up the process.

Continue adding and mixing layers of greens and browns until you either fill the bin or run out of materials. Slant the top of the pile to the center to catch rainfall. You may want to cover the pile with a plastic covering or tarp to regulate the amount of moisture entering your pile. The cover should not rest on the pile because it may cut off oxygen.

Periodically, check the moisture content of your pile. The compost should feel damp. Check the interior temperature of your pile and when the temperature reaches 140 °F or begins to fall, it is time to turn the pile. You will need to turn your pile every three to five days. Once your turning causes no rise in temperature, and the material appears dark and crumbly, your compost is ready.

**"Slow" Compost Method:** Slow composting is the least labor-and time-consuming way to compost; it is ideal for people who do not have a large amount of yard trimmings to compost all at once. This method can take from six months to two years or longer to produce compost, so be patient.

The ingredients are the same as those for a "fast" compost. Add greens and browns to your pile whenever they become available. Turn the pile occasionally to mix the materials together to prevent the materials from clumping together and to avoid anaerobic decomposition. You will know that your materials are decaying without oxygen by the foul odor: a telltale sign for you to turn the pile. Look for ready-to-use compost near the bottom of the pile.

**Using Compost.** Think of compost as a soil amendment and not as a fertilizer, since the nutrient level of compost is low and released over time. Mix compost with soil to enrich the flower and vegetable garden. It can be used to improve the soil around trees and shrubs, as a top-dressing for lawns, or as a mulch. Screen compost by separating the larger particles and any uncomposted materials from the finer ones and add it to the potting mix for houseplants. No more than one-quarter to one-third by volume of the potting mix should be compost.

Soaking compost in a burlap or cheesecloth sack steeped in water can make compost "tea." The weak nutrient solution can be given to young plants.

Compost piles and bins vary widely in design. Expensive, manufactured compost bins are available through many companies online or at a local hardware store. Other, more simple yet just as effective designs can be made at home with wooden planks, chicken wire, or just with a simple pile of compostable materials that can be covered with burlap or plastic as needed to retain heat and moisture.