

SHORE STEWARDS NEWS

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Island County, Washington

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The newsletter was compiled by Scott Chase, Island County Shore Stewards Coordinator.

Composting for the Homeowner

As summer comes to an end and the cooling rains return, Puget Sound residents see their dry, brown lawns regain their lush green look, providing a reminder that it's once again time to mow. Fall will soon cover those lawns with brightly colored leaves that quickly turn to brown, and soon we have a growing supply of grass clippings (greens) and leaves (browns) we need to dispose of. We know about the erosion problems associated with tossing yard waste over our bluffs or onto the beach, and not everybody has the option of having yard waste picked up at the curb. This is a good time to consider building or buying that compost bin you've been thinking of the past several years. This issue of Shore Stewards News offers some ideas on how and why composting offers a solution to your yard waste problems.

The Benefits of Composting

According to the Environmental Protection Agency, almost 1/5 of the garbage in our landfills each year consists of yard waste. When taken to a landfill, this yard waste is buried under tons of other garbage, deprived of the oxygen required to decompose. When added to your compost bin instead of being dumped, the nutrients present in the waste materials are no longer lost, but are turned into a resource that can be reapplied to the yard and garden. Nutrients in the compost are released slowly, as compared to store-bought fertilizer, and are less likely to leach out of the root zone. Since it is added to your yard or garden as organic matter instead of chemicals from a bag, you improve the soil structure, allowing good root penetration and water retention. Earthworms love soil amended with organic matter, too. Their tunnels assist with drainage, and their casts (poop) provide additional nutrients for your lawn or garden.

When the yard waste is added to your compost bin in correct proportions, and kept sufficiently moist, temperatures rise as the materials begin to compost. These temperatures can be high enough to destroy most disease pathogens, as well as destroying the majority of the weed seeds. If the materials are acidic, the composting process can convert them to an almost neutral pH. Compost that is added to the soil can also act as a buffer against high or low pH, assisting in making the nutrients more available to plants.



How the Composting Process Works

Home composting is a process that helps us speed up the breakdown or decomposition of organic materials, occurring when microorganisms use organic matter as a source of energy and food to multiply and grow. These microorganisms live in the thin films of water that surround particles of yard debris, food scraps and other raw organic matter, and help to generate heat, water and carbon dioxide. Over time, the microorganisms use up the food and we end up with finished compost. We help this process by making sure the material is a mixture that bacteria and microorganisms can easily feed upon and turn into compost, with a goal of a proper C:N (Carbon:Nitrogen) ratio. Carbon, in the form of browns (like fallen leaves, twigs, and sawdust), serves as a source of energy. Browns are also used for absorbing excess moisture and giving structural strength to your pile, helping to keep the pile porous, prevent compaction, and help with air flow, which is why browns are also referred to as bulking materials.

The green materials, which are the nitrogen source, are colorful and wet. They provide nutrients and moisture for the compost workforce. This can be compared to a balanced diet, and having proper proportions of each makes this “diet” work better. Other important factors in what you need to help the microbes do their job include porosity and particle size, moisture, oxygen, pile size, location and temperature.

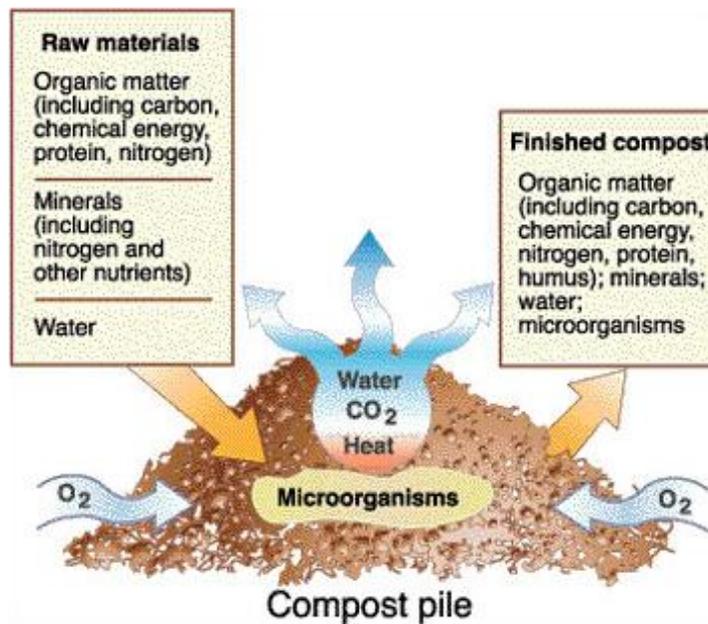


Image University of Missouri Extension

What to Consider for Successful Composting

Materials: Raw materials in a commercial composting facility may include not only yard waste but also old fruit and vegetables, manures, fish, slaughterhouse remains, corn cobs and stalks, blood meal, straw, hay, cardboard, bark, sawdust, and many other assorted materials not usually found in a home compost bin. Fruit and vegetable scraps will compost in your bin, but can also attract pests like flies, rats and raccoons, which is why the information here only uses yard waste. Food scraps are better to compost in a home worm bin, which won't be covered in this newsletter. Worm bin information can be found in the resources section.

Proper Mixture of Greens and Browns: When looking at the C:N ratio, the nitrogen number is always expressed as a 1, so C:N shows the amount of carbon per unit nitrogen. A 30:1 ratio means there are 30 parts of carbon for each part nitrogen in the mixture. For a compost pile, the target range is 20:1 to 40:1. Greens such as grass clippings, flowers, and weeds (without weed heads) have a C:N range from 9 – 25. Do not include greens that have been treated with fertilizers or pesticides, including Weed and Feed mixtures. For browns, deciduous leaves range from 40 – 80, so a combination of the two can help you reach the target range. Bulking agents like wood chips, sawdust, straw and paper may also be used in place of dry leaves for browns, though it is best not to overload on any of these other materials in one layer. Tea, coffee grounds and coffee filters may also be added to the pile. In practical terms, a good mix of browns and greens in your compost pile is about 4 parts browns (carbon) to 1 part greens (nitrogen).

Air Circulation & Moisture: Oxygen is also needed for the pile to work, and having at least 5% oxygen content keeps the pile from becoming anaerobic. Your sense of smell works well to detect whether the pile has enough oxygen. Grass clippings by themselves, for example, compact down and release liquid, providing no pore space for oxygen and ending up smelling like a pile of slime. Adding browns and chopping the garden wastes into different sizes prevents compacting and leaves space for air to circulate, helping keep the pile aerobic. This can be accomplished by chopping the yard wastes with a machete or shovel, running them through a shredding machine, or lowering a running lawnmower over a pile of leaves before adding it to the pile. Turning the pile on a regular basis also allows air to better flow through the pile. Microorganisms also need moisture to work, and compost piles need to have 50% to 60% moisture, by weight, about the amount you would find in a wrung-out sponge.

Pile size: The size of your pile will be important to consider in generating and maintaining a hot composting process. A good size would be at least a cubic yard (3 feet x 3 feet x 3 feet) to self-insulate during the period of active composting, but no larger than 5 feet x 5 feet x 5 feet. A larger pile may hold too much water and not allow enough air into the center, creating an anaerobic environment, since air naturally penetrates 18 to 24 inches into the pile from all directions. A larger pile may also be too heavy for people to turn. Commercial bins usually hold smaller quantities than a cubic yard, but can still heat up enough in the middle to compost slowly.

Location: Where you place your compost pile should be carefully considered for most efficient composting. You should first check to find out if your community has any restrictions regarding composting, or whether your municipality has any setback requirements. Find a level location with good drainage, not one that will sit in standing water. Avoid areas with sunlight over half the day, and areas with strong winds, as these can cool and dry the pile. Shady areas are fine, but branches above may restrict rainfall from providing sufficient moisture. If you are too close to trees, tree roots may work their way into the pile searching water and nutrients, and turning the pile may damage the tree roots.

Make sure your location is easy to get to, and not a long distance to access. It should not interfere with family activities, but should be close to a water source like a hose bib. Keep the bin away from dog and livestock areas, as urine and feces may include unwanted pathogens.

A pile placed against a house, barn, shed, or fence could cause the wood to decay. Locating it under eaves or a wide overhang could prevent rain from providing moisture, and placing it under a rainspout or gutter-less roofline could saturate your pile.

When to Compost: Spring and early summer may have high nitrogen materials available, but not much in the way of carbon materials, unless you have piles of brown leaves from the previous fall. Fall is when you find greens available from later summer and early fall mowing, and carbon from fallen leaves is easily available, so is the ideal time to start composting.

Tools: Rather than investing in a compost turner, a 4 or 5 tined fork available at any home center, hardware store or nursery works just as well. A garden hose or watering can works well to moisten the pile. Pruners, a machete, shovel or a shedder should be used to cut up large pieces and increase surface area. A compost thermometer helps monitor the temperature of the pile, but inserting a metal pole into the pile and checking to see if it is warm or hot after a few minutes is also a good indicator.

Starting and Maintaining Your Compost Pile

The recommended practice in starting a compost pile is to layer the materials uniformly and thinly, avoiding using too much of any single ingredient and never skipping a layer in the process. This is only needed when you are starting the pile; after it has become active, you can add materials by burying them in the center of the pile or adding them when you turn the pile.

Starting the pile on bare ground is recommended, not on asphalt or concrete. If you'd like to provide greater aeration at the base and improve drainage, try digging a trench across and beneath the center of the base, covering it with stiff hardware cloth before beginning the layering process. This will provide air channels from below. Start with the bottom layer of browns, which can be 4" – 6", followed by a green layer of 1" - 2" thick. Continue to add browns and greens in layers, similar to lasagna, firming and lightly watering each layer as it is added, but not compacting it so much that air cannot move freely through it. (If you are adding grass clippings that are wet or might mat, keep those layers thin, no more than 2" thick.) To determine how much water to add, squeeze the organic material after watering. It should feel damp to the touch, like a wrung out sponge, with just a couple drops of water expelled when squeezed tightly.

Layering has helped you gauge the amounts of browns and greens you have added. Left alone, this layered pile will compost in 6 months to a year. The composting process works quicker, however, if the layers are mixed before adding new layers. Using a tined fork, mix the first few layers together until they are evenly distributed before adding new layers. After you add a few more layers, mix those together as well, as this helps speed up decomposition. Some composters mix all of the materials together on the ground or on a tarp, and then moisten the mixture before adding the materials to the bin. You are welcome to try different methods and different ingredients until you discover what works best for you.

Within a few weeks, decomposition should begin, and temperatures in the pile can reach 110 to 160 degrees. The pile should also begin to settle. You should then decide whether you want to continue adding to the pile, or let it continue to compost. You can add to the pile throughout the growing season and into the winter. When you add fresh materials, you'll need to turn the pile on a more frequent basis. If you are monitoring the temperature, you should be turning the pile whenever the temperature falls below 110 degrees for optimal breakdown of materials, which could be weekly. Most composters, however, turn their pile every 4 to 5 weeks, which mixes the new material with the



Photo: University of Nebraska-Lincoln Extension

older, adds air, and allows you to add water. If started in the fall, a pile which is added to and turned the following summer should be ready by the end of summer or early the next year.

If you are not adding a lot of new material, turn and water the pile every 5-6 weeks after it first gets “hot”, turning the outside of the old pile into the middle of the new pile. This compost could be ready as soon as 3 – 4 months, depending on time of year.

Troubleshooting Your Compost Pile

Pile won't heat up enough:

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|------------------------------------|---|
| 1. Not enough moisture: | Add water if dry |
| 2. Pile size is too small: | Build up pile to at least 3 ft x 3ft x 3 ft |
| 3. Lack of nitrogen-rich material: | Mix in more grass clippings |
| 4. Particle size is too big: | Chop or grind materials |

Pile is smelly:

- | | |
|----------------------|--|
| 1. Pile is too wet | Add more “bulking agents” (dry leaves, twigs, etc) |
| 2. Pile is too tight | Turn it to loosen and allow better air exchange |
| 3. Wrong materials | Do not add dairy products or meat |

Pile has slugs in it: Remove the slugs and slug eggs from pile. The eggs look like very small clusters of pearls. Locate the compost pile far from vegetable gardens.

Pile attracts flies, pests, and rats: Avoid putting any bones, meat, fatty or starchy foods, or animal manure into the pile.

Simple and Inexpensive Compost Bins

Although composting can be done by just placing your materials in a large pile, bins can be beneficial to the home composter. They can be 3 or 4 sided, with a removable front to make turning easier, or a circular wire cage. Bins can be made from pallets, scrap wood, new lumber, fencing, cinderblock, or cement. Or you can purchase metal, wood, or molded plastic containers. You can find many plans for building compost bins by doing a quick online search, or in books available in your library or book store. A few examples follow, which are both simple and inexpensive to build. Make sure the base is at least 3' x 3', and the height comfortable enough to make turning easy.

Wood Pallet Bin

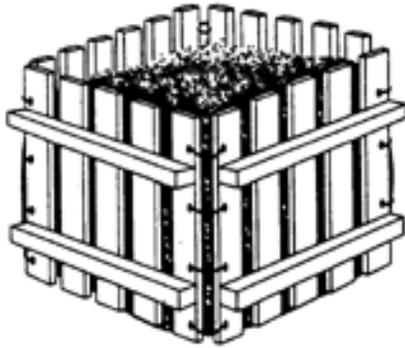


Image: Ohio State University Extension

Wood pallet bins are easy to build, and the pallets are usually free, stacked in piles in the parking lot of many businesses. (Be sure they are being given away free of charge before taking any away, of course.) Select four pallets of the same size to make up the four sides of your bin. You can connect them by tying them with rope, wire, or string, or nail them together with double-headed nails. The illustration at left shows a bin with four holes drilled near the outer edges, with wire holding them together. Make your bin so that you can easily open or remove one side when you want to harvest or move the compost.

Wire Mesh Cage Bin

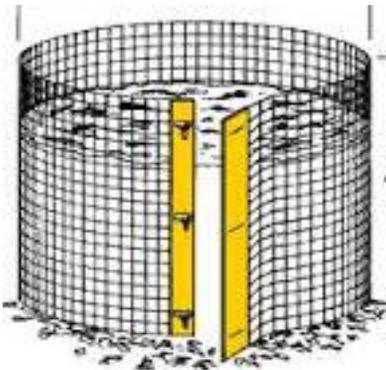


Image: University of Minnesota Extension

A wire cage composting bin is also easy to build, since you are just attaching a board to both ends of a length of wire mesh or hardware cloth and bending it into a circle. Be sure to wear gloves and take care not to poke or scratch your hands with the sharp wire edges.

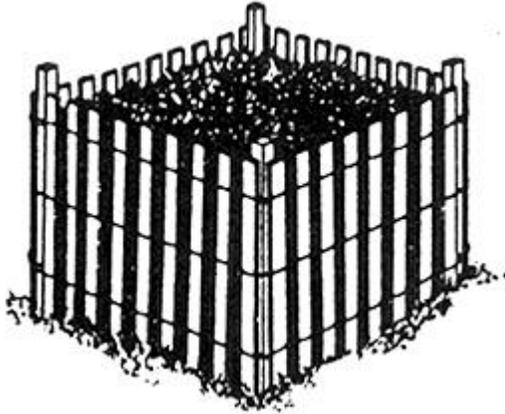
Tools: Heavy duty wire or tin snips, metal file, pliers, staple gun, work gloves.

Materials:

- Either 1" welded wire, ½" hardware cloth, or chicken wire, 3' wide and 9' to 12' long, depending on desired bin width. A 9' length will give you a 3' diameter bin.
- Two 3' lengths of 1 x 4 fencing material or similar scrap wood.
- Two or three large hook-and-eye gate latches.

Roll out and cut the wire material, and trim ends flush with one of the wires that runs across the width of the material, to eliminate any loose edges that may scratch or poke your hands. File each wire end smooth along the cross wire if you'd like to avoid any accidental scratches. Use a staple gun to staple one 3' length of the fencing or scrap wood to each end. Bend the wire into a circle and attach it with the hook-and-eye latches to "close" the circle.

Snow Fencing Bin



Though it is not used much on the west side or our state, snow fencing can be found at many large building supply or farmers supply stores, and makes for a good, simple-to-build bin.

Image: University of Missouri Extension

Tools: Heavy duty wire or tin snips, pliers, sledge hammer, work gloves.

Materials:

- Four wooden or metal posts, 4' to 5' long
- Heavy wire for ties, cut into lengths for attaching fencing to posts.
- A 13' length of snow fencing, at least 3' tall.

Find a 3 foot square site for your bin and pound the posts into the ground 3 feet apart, located at the corners of the square. Using the lengths of heavy wire, attach one end of the snow fence to the outside of one of the posts. Wrap the fencing around the outside of the posts, ending back at the first post. Attach that end of the snow fence to the post so that it can be opened for harvesting or moving the pile,

Resources

Composting at Home – The Green and Brown Alternative, Cornell Waste Management Institute, Department of Crop and Soil Sciences, 2011:

<http://cwmi.css.cornell.edu/compostingathome.pdf>

Composting and Recycling, WSU Whatcom County Extension,

<http://whatcom.wsu.edu/ch/compost.html>

Composting, WSU Waste Wise, Island County Extension:

<http://ext100.wsu.edu/island/composting/>

Worm Composting, Clemson University Extension, 2009:

http://www.clemson.edu/extension/hgic/plants/other/compost_mulch/hgic1607.html

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The website for the Northwest Straits Commission can be seen at <http://www.nwstraits.org/>

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Your Shore Stewards Coordinator is Scott Chase, (360) 387-3443, ext 258, or email shorestewards@wsu.edu .

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