



# SHORE STEWARDS NEWS

November 2012

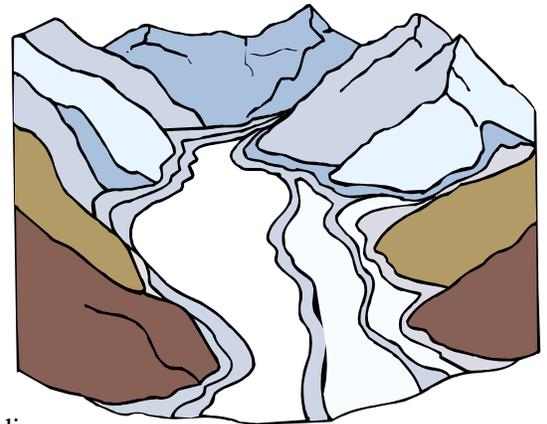
Island County, Washington

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## Want Healthy Soil? Use Compost

We have many different soils in the Puget Sound area. Part of that is due to enormous glaciers half a mile high (that's four Space Needles stacked on top of each other!). They extended as far south as Olympia more than 10,000 - 15,000 years ago, and obliterated all the soils beneath it. When the glaciers melted, they mostly left behind a mixture of sand, silt, clay, and rocks and beneath that, what we 'lovingly' call glacial till.



### **Problem: Vanishing Topsoil**

Topsoils in our area are typically only three to 12 inches deep. The greatest concentration of organic matter remains in the top six inches of soil, and the most fertile soil is the top few inches of that. This thin layer of soil has been affected by development practices – bull-dozing off existing topsoil during grading, compacting the whole site with heavy equipment during construction, and replacing only one to two inches of soil over the compacted subsoil before landscaping with an instant (roll-on) lawn. Today we know this is a poor environment for plants to survive in, and only increases the risk of runoff and harm to nearby streams, lakes and Puget Sound.

### **Solution: Compost!**

Compost is what results from the biological decomposition of organic material (living and dead plant or animal matter). Composting transforms plant and animal matter into a biologically stable substance. Common composting materials are animal manures, food wastes, yard debris, sawdust, wood chips and bark. Besides providing organic material, compost also supplies a modest amount of nutrients released slowly over years. And compost has a unique ability to improve the chemical, physical and biological characteristics of soils.

Compost is considered a soil conditioner rather than a fertilizer based on its effect on plant nutrition. Fertilizers are a source of readily available nutrients and have a direct, short-term effect on plant growth. Soil conditioners, on the other hand, affect plant growth indirectly by improving the physical and biological properties of the soil, such as water retention, aeration and microbial activity and diversity. Chicken manure is an example of an organic amendment with fertilizer value simply because more than 25 percent of its total nitrogen, phosphorus and potassium are in forms that plants can immediately absorb. However, amendments like municipal yard waste, food waste, and bark are examples of soil conditioners because their nitrogen, phosphorus and potassium are in forms that plants can't use (until changes take place underground). They are not considered fertilizer substitutes; instead they mainly improve soil properties by building soil organic matter.

## The Latest on How to Care for Your Soil!

While many of us already know the wonderful benefits of compost for soil, plants and the environment, did you ever wonder how much of it is actually true? Well, it's a researcher's job to systematically investigate and study things to establish facts and reach new conclusions. In 2001, Dr. Craig Cogger, a soil specialist, and other scientists at the WSU Research and Extension Center in Puyallup wanted to do just that with compost in urban soils. So they began a long-term study to understand the effects of bark and compost on soils and plants in a landscape setting.

**What is bark mulch?** This is chopped up tree bits, sometimes called hog fuel or arborists chips. It should not be mistaken with Beauty Bark which only includes the bark of the tree and repels water and is slow to break down.

Until then, research on organic amendments like compost in urban conditions had mostly been on done on planting holes for trees and bushes, with few or little benefits observed. So what happens when you amend an entire planting bed or landscaped area? The following is some of what they have learned so far:

### Soil Compaction

**Findings** = After taking measurements for the first four years of the study, soil was found to be the least compacted where bark mulch was applied on the surface along with compost that was incorporated into the soil. Soil was slightly less compacted where bark and compost were applied only on the surface. Bark mulch with compost mixed in the soil reduced compaction to a depth of one foot.

**Action Tip** = Since most Puget Sound urban yards and portions of suburban and rural properties are probably compacted due to construction and/or the effects of time, this one-two punch of applying compost (either mixed in or placed on top) along with bark mulch on top is an excellent soil treatment. Best time to do this is in the fall before our rainy season starts or has just begun. Doing it now versus in the spring means you'll let Nature water the compost for you, and you're already protected against the onslaught of spring weeds that always seem to go to seed way too early.



### Water Infiltration

**Findings** = Where bark mulch and compost were used together significantly increased the rate by which water moved into the soil. Protecting the soil surface with bark or compost was as effective as incorporating compost into the soil.

**Action Tip** = This is another reason to use both compost and bark, not only for your soil and plants, but also to reduce the runoff from your property which can have negative consequences downstream. If you don't have the time or energy to dig the compost into your landscape beds, applying it as the first mulch layer and adding a layer of bark on top of that can work almost as well.



### Moisture Content

**Findings** = Both bark mulch by itself as well as bark plus compost mulch on the soil surface held more water one and one-half months longer than soil with compost mixed in, or unamended soils did. This may not translate to more water available to your plants – research so far is unclear why this may be.

**Action Tip** = Bottom line here, at least add bark mulch to your landscaped areas in the spring or fall, so that when our hot dry summer arrives, you won't be spending as much time or water to keep your heat-stressed plants alive.

## Weeds

**Findings** = Bark mulch reduced weed populations by 99 percent in first year of the study. Compost mulch was only effective during the first summer, then weeds became established during the first fall and winter.

**Action Tip** = Because compost is such an excellent soil amendment, weeds love it, too. So . . . if you don't want to weed that much, do yourself a favor and apply bark mulch on top of compost.

## Mulch Depth and Effectiveness

**Findings** = Six years after mixing compost into the soil, the average compost depth was 52 percent of its original depth. The average bark depth was 76 percent of its original application depth. This indicates good persistence of organic amendments over time. Another study started in 2000 on native plantings in urban natural areas, found evidence that plants in mulched plots were larger, more vigorous, faster-developing, and had higher rates of survival than plants in herbicide-treated plots. The mulched plots also had fewer weeds, helping to reduce competition for resources.

**Action Tip** = This means your one time effort applying compost or bark can reap good results for five or six years. Isn't that the kind of yard work we'd all love to do?

*Note:* If you buy commercially available compost, be aware that the US Composting Council has a Seal of Testing Assurance (STA) program. Members in this program must test their products for pathogens, heavy metals and pesticides on a regular basis. These numbers are available to the public. More information can be found on their STA website page: <http://compostingcouncil.org/participants/>.

## Compost and Your Lawn



Studies show that there are two effective ways to use compost for a healthy lawn. **For a new (to be seeded) lawn**, you can apply 15 to 25 percent compost (by volume of your lawn area), and then dig or till it four to six inches deep into the soil. The higher application rate is best for soils low in organic material, such as our subsoils. Fine compost particle size is usually recommended to ensure good seed-to-soil contact. Timing is important here ~ early fall is best (when air temperature is between 60 and 85 degrees F). Another good time is late spring. Avoid summer and late fall if you can.

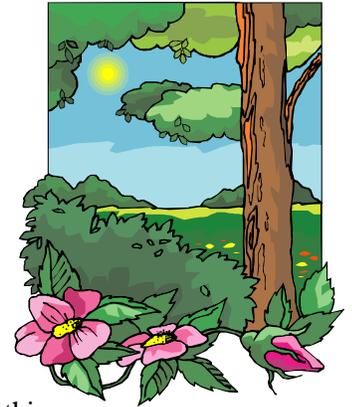
Compost helps establish a healthy root system, and supplies a portion of nutrients needed for turf grass for at least two growing seasons. Studies have shown improved turf quality in the second and third years after application.

**For an existing lawn**, use compost as a top dressing, by applying a thin layer (1/4 inch) with a spreader and work it into the soil with a rake. Or you can incorporate compost into your lawn via aeration. Apply the compost, then go over your lawn several times using an aerator with hollow tines and a heavy drag mat. It's best to do this when the weather is cool and moist (spring or fall). Fall is a great time to do this because rain will help move the compost into the soil. This also gives the soil time to make more nutrients available for grass to absorb in the spring, when the growing season begins. Recent research has also shown that using high quality compost can degrade some turf pesticides over time, reducing contamination of nearby streams or lakes.

## Compost and Your Landscaped Areas

Just as for lawns, there are two ways to compost for a healthy landscape bed. **For a new landscape bed** dig in a layer of compost before any trees, shrubs or flowering plants are installed (fall and spring are the best times to do this). Results from WSU's 2001 study suggest that using a maximum of about one-third compost (by total volume of area) is suitable for establishing landscape beds in Pacific NW soils degraded by development. In most degraded landscapes, compost applications of two to three inches, amended eight to ten inches deep, can offer long-term improvements for your soil. Hand digging is recommended over using a tiller to keep the soil structure intact and keep soil microorganisms in their preferred layers of soil.

**For an existing landscaped area**, add compost among established plants and dig it in where ever you can without harming shrub and tree roots. As research has shown, a close second is applying a two- to three-inch top dressing. Fall and spring are the best times to do this. Again, is it also beneficial to cover your landscaped areas with three inches of bark mulch.



## Resources

- Cogger, C. 2012. Soils and fertilizers in natural yard care. Presentation to WSU Extension Natural Yard Care mentors.
- Cogger, C., R. Hummel, J. Hart and A. Bary. 2008. Soil and red osier dogwood response to incorporated and surface-applied compost. HortScience 43 (7): 2143-2150.
- Cogger, C.G. 2005. Potential compost benefits for restoration of soils disturbed by urban development. Compost Science & Utilization. Vol 13, No 4: 243-251.
- Cook, T. 2002. Practical lawn establishment and renovation. Oregon State University. EC 1550. <http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/19278/ec1550.pdf>
- Landschoot, P. Using compost to improve turf performance. Penn State Extension: <http://pubs.cas.psu.edu/freepubs/pdfs/uc123.pdf>
- WSU Extension website, Organic Farming Systems and Nutrient Management page: <http://www.soils1.org/>
- WSU Waste Wise website, Island County: Composting <http://county.wsu.edu/island/nrs/wastewise/Pages/Composting.aspx>



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