

Soil Health

Yard by Yard Practices

- Mulching
- Composting
- Mulch Mowing
- Increase Mowing Height

The Importance of Healthy Soil

Did you know that "soil" and "dirt" are not the same thing? "Dirt" is made up of minerals--lifeless particles of sand, silt, and clay. "Soil," on the other hand, adds water, air, organic matter, and soil organisms to the minerals found in dirt. Healthy soil is *living* soil, and it provides a variety of benefits that mere dirt can never match.

Healthy soil is full of fungi, bacteria, nutrients, air, and water that are needed to keep plants thriving. If your soil is healthy it can reduce or even eliminate your need for added water and fertilizer (especially for native plants). It even leads to stronger plants that need less help from pesticides to fight off disease and pests.

There are six principles of soil health, which will improve your soil quality if followed. They are:

1. **Know your context** -- there is no "one size fits all" recipe for soil health
2. **Cover the soil** with living plants or mulch -- exposed soil easily erodes and declines in quality
3. **Minimize soil disturbance** -- tilling the soil often disrupts the natural processes that lead to soil health
4. **Increase diversity** -- grow as many species of plants as you can to diversify the inputs to your soil
5. **Maintain living plants** in the soil -- plant roots feed the soil organisms that lead to healthy soil
6. **Integrate livestock** -- animals are a natural part of the ecosystem and should be present where possible

The Yard by Yard program embraces these principles and encourages simple practices that build healthy soil in your yard. Mulching and composting both help your soil retain water and increase in organic matter. Even small actions like increasing your mowing height and making sure to keep something growing in your soil year-round can significantly improve your soil health. Keep reading to see how to put each of these practices into place.

Putting the Practices into Action

Mulching

Mulch is simply a layer of organic matter placed on the soil surface: wood chips, dead leaves, hay/straw, pine needles, even shredded paper or cardboard can be used as mulch. Of all the soil health practices promoted by Yard by Yard, mulching may have the best ratio for ease of use to benefits created. Mulch can help your soil retain water, maintain an optimal temperature for plants, aerate and add organic matter to the soil, and reduce weeds and plant diseases. To top it all off, using mulch can beautify your yard and make your plantings look intentional and well cared for.

Here are some things to keep in mind:

- Add mulch in layers 2 - 6in deep. Deeper layers provide a stronger weed barrier. Coarse wood chips should be placed in deeper layers while a 2 - 3in deep layer of finely shredded wood is sufficient.
- Don't mound the mulch around your plants since it can lead to rot in the stems.
- Straw and hay make great mulch, but make sure they come from an herbicide-free source! Contaminated straw/hay can kill your garden plants.
- Mulch placed over cardboard can be a great way to smother unwanted invasive plants. Search "Lasagna Composting" to learn how to create a new garden bed over top of unwanted invasive plants.
- Don't mix wood chips into the soil! As the soil microbes break down the wood they will use up nitrogen in the soil that your plants need to grow. Make sure to keep mulch on the soil surface and avoid mixing it into the soil itself.

Additional Resources

[OSU Extension Mulch Fact Sheet](#)

Composting

Composting combines art and science to harness the natural processes of decomposition to turn food and yard waste into organic matter that nourishes your soil and plants. The benefits of composting are twofold. First, it reduces the amount of waste you send to the landfill (up to 50% of household waste could be composted!). Second, it provides holistic nutrition to the plants, not only adding nutrients into the soil but encouraging beneficial fungi and bacteria that your plants rely on to survive.

There are as many different ways to compost as there are people who practice composting, so for many this is an intimidating topic to dive into. Thankfully there are many resources available for anyone who wants to start composting. [The Oklahoma Composting and Sustainability Association](#) is a great place to start! Or keep reading for some of the basics.

Hot vs Cold

There are two classifications of composting systems. "Hot" composting is hands-on and requires regular attention, but generates high enough temperatures to kill pathogens and weed seeds and produces

"finished" compost in as little as six weeks. "Cold" composting is much more hands-off, but relies on slower processes (6 - 12 months to "finished" compost) and does not reach temperatures high enough to kill pathogens and weed seeds. Both processes will yield beneficial compost, so your choice of system depends on how long you are willing to wait and how much effort you plan to commit to your compost pile.

Methods of Composting

There is no "one size fits all" recipe for composting. Choose a system that works for you (consider how big your space is, how much time you want to invest, and how quickly you need your compost). Even within the following methods there can be enormous variation in styles. What is important is to find a style you are comfortable with and one that you are confident putting into practice. This can change as you learn and grow more comfortable with the process. Some of the most common methods include:

- Piles
- Bins / cages
- Tumblers / rotating drums
- Keyhole gardens
- Vermicomposting (composting with worms)
- Lasagna composting
- Trench composting

Check out [this simple quiz](#) to see what compost method might be best for you. After you get your results try digging into some of the online resources available by searching for guides to that composting method or watching videos on YouTube.

What does a compost system need?

At its most basic, a properly functioning compost system needs to supply air, water, carbon, and nitrogen. The microbes in your compost system need oxygen to break down the organic matter, which is why turning the pile or aerating it through another method will speed up the composting process. Likewise, the microbes need water to survive and thrive. Keep your compost pile damp but not soaking wet. Carbon and nitrogen are the fuel for the microbes and provide the nutrients that build healthy soil and feed your plants. Carbon is typically supplied by brown plant matter (wood chips, leaves, cardboard, old grass clippings) and nitrogen comes from green plant matter (fruit/veggie scraps, fresh leaves and grass clippings). You typically want to add about two to three times as much "brown" materials as "green" material to fuel your compost system.

Static Piles: A Guide to a Simple Composting Method:

A static compost pile (i.e. a pile that you do not turn and simply add fresh material to as it becomes available) is probably the easiest way to get started composting. As you get comfortable with the process you can explore more hands-on methods as well. Follow these steps to get started with a static pile:

1. Location -- choose a site that has easy access, a nearby water source, is conveniently located for adding and removing material, and won't detract from the landscape (in most places, compost piles can't be located in front yards).

2. Bin or no bin? -- If you can, allow your compost to make contact with the ground (which makes drainage easier and lets microbes, fungi, and soil arthropods help with the composting process). You can simply have a pile on the ground, or you can build an open bin to keep the pile more contained. Staking three old wood pallets together to form a three-sided structure is a good way to keep your compost in place, looking tidy, while still allowing air and water to get into your pile.

3. Collect your "brown" material -- since you will need more "browns" (for carbon) than "greens" (for nitrogen), it is often helpful to collect these into a large pile or storage container for later use. Small wood chips and dead leaves (shredded is best) are good options and usually readily available.

4. Start adding material -- Once you have enough green material to add a layer at least an inch thick you can get started. First add a layer of brown material, then lay your greens on top, and cover with another layer of brown material. Remember that you want two to three times as much browns as greens. Keep alternating brown and green layers as you add materials.

5. Keep food scraps covered -- burying food scraps deeper in your pile will cut back on the likelihood of pest problems and will make sure odors do not become a problem.

6. Keep your pile watered -- Try not to let your pile ever dry out, but don't get it soaking wet either.

7. No need to turn -- Turning your pile will speed up the composting process, but the appeal of this method is that it does not need the added effort to be successful.

8. Wait! -- The tradeoff for the ease of this method is that it takes a long time. It may be a full year before your pile has turned into finished compost ready for use in your garden. If you don't need huge amounts of compost, this method is great because it will provide you with fresh compost each spring, and then you spend the rest of the year building up your pile again for use the following spring.

How to apply compost to your plants

Whether you make your own compost or purchase it from a reliable source, your plants and soil will thank you. Compost can be used in the garden for flowers or vegetables and inside for your house plants. Try adding a handful of compost at the base of your seedlings when you plant annuals in the spring or plant a new perennial. If you grow vegetables from seed, spread compost on your seedbed and mix it into the top inch or two of soil before sowing seeds. You can "top dress" perennial plants, lawns, and houseplants by adding a little bit of compost on top of the soil around the plant, up to a couple times a year. You can also make a "compost tea" by steeping 1 1/2 cups of compost in 1 gallon of water for at least an hour (and up to two weeks), then use this liquid to water your plants.

Some Final Considerations...

- **AVOID** adding meat, oils/fats, dairy, tobacco, charcoal, pet food, bread, pasta, processed foods, animal carcasses, and animal waste. These can inhibit the composting process or introduce pathogens (most backyard composting systems don't get hot enough to kill germs).

- Be careful using cow and chicken manure. These can both introduce pathogens to your compost. Cow manure can also transport herbicides that will kill your garden plants if the cow fed on some herbicide-treated pastures. While there is a place for both these manures in composting systems it is best to consult with an experienced composter before adding them to your system.
- **AVOID** compostable/biodegradable plastic cutlery and cups. These are designed to be composted in industrial-scale systems that get much hotter than backyard systems.
- Have your soil tested regularly. Some composts can be high in phosphorus. While this is an essential nutrient for plant growth, it builds up in the soil and can actually harm your plants if it is too abundant. Testing your soil once every year or two will inform you of what should be added to your soil.

Mowing and Lawn Care

The choices you make regarding your lawn care are surprisingly impactful. Americans often seem obsessed with their lawns and many environmentally-conscious homeowners and speakers are prone to quickly point out the harmful impacts of traditional lawns. So first, let's talk about why lawns are desirable and some of the benefits they do provide.

A healthy, green, well-maintained lawn can be very visually appealing. Lawns provide a sense of order and place of openness that many people find desirable. They are great places for pets to run around and for kids to experience the joys of playing outdoors. A *healthy* lawn (more on that later) can increase home values, provide oxygen*, offer some cooling effects*, and helps control erosion*. It's understandable that many homeowners and neighborhood associations want thriving lawns in their communities. However, it is equally true that most lawns fall far short of these ideals and even the best lawns often occupy more than their fair share of space and resources.

*lawns offer these things *in comparison to bare soil*. There are better alternatives available.

The negative effects of lawns can be placed in two groups: active impacts and missed opportunities. The **active negative impacts** of lawns and lawn maintenance are quite serious. Lawns are now the largest irrigated crop in the US (according to a NASA study) and can use up to 200 gallons of water (usually drinking water) each day to stay green. Gas-powered lawn mowers are a significant contributor to air pollution and lawn herbicides and fertilizers are major causes of water pollution in our streams, rivers, and lakes. Grass lawns are usually found in housing developments that replaced wildlife habitat, but these lawns offer no food or shelter for the vast majority of wildlife species. Finally, turfgrass is generally very bad at absorbing rainwater and runoff, which leads to flooding and water pollution in

urban areas. Lawns absorb about 70% less rainfall compared to cropland, and in some cases are little better than paved areas at capturing rainwater.

Just as bad as the active impacts of lawns are the **missed opportunities** for doing something actively beneficial. The supposed benefits lawns provide for reducing erosion and cooling the environment are only in comparison to bare soil, and only occur if the lawn is *healthy*. While there is a place for incorporating healthy lawns into our landscape design, they should be a much smaller proportion of our residential properties. Lawns take up huge amounts of space that would be much better used for growing native plants, trees, or vegetable gardens. These vegetation types provide many more benefits to humans, wildlife, soils, and water systems.

Native prairie grasses with deep roots pull carbon from the atmosphere and add it to the soil. Wildflowers provide food and shelter for butterflies, bees, and birds. Trees are significantly better at cooling the landscape and also provide habitat for wildlife. Backyard vegetable gardens provide fresh, healthy food (for humans and wildlife) that is free of potentially harmful pesticides and cuts down on pollution from transportation. All of these can be incorporated into household landscapes without completely eliminating lawns and the benefits they do provide. But when lawns outgrow their rightful place in our lives, they are much more destructive than beneficial in the big picture.

So, you want to change your lawn management?

If you decide that you do need (or want) to keep some or all of your lawn, there are still several management choices you can make to lessen the negative impacts of your lawn and increase the positive impacts:

- Practice mulch mowing -- when possible, leave some or all of your lawn clippings on your lawn. As long as they are not in thick mats that will smother your grass, the clippings will make their way to the soil surface where they will break down and improve your soil quality over time.
- Increase your mowing height to 3" or higher -- Taller lawns have two benefits. First, longer blades of grass will slow down runoff from storms. This will reduce erosion and increase the amount of water that actually soaks into your lawn (reducing water pollution as well). Second, remember that the roots of your lawn are roughly in proportion to the blades of grass. If you keep your grass short, its roots may only extend an inch or so into the soil. Longer roots store more carbon, nourish more soil organisms, add more organic material to your soil, and open up channels for water to soak deeper into your soil.
- Add compost to your lawn instead of synthetic fertilizers -- you can spread a thin layer of compost on your lawn up to four times throughout the year. Not only will compost supply nutrients to your plants but it also builds healthier soil that can retain much more water.

- Allow more plant species to grow in your lawns -- plants like clover, asters, dandelions, henbit, and others provide benefits for soils and wildlife and can help reduce some of the negative impacts of lawns. These species feed bees and other pollinators, nourish soils, and can make your lawn more resistant to true pest species like sand burs.
- Aerate your lawn to reduce compaction, increase water infiltration, and improve lawn health.
- Consider alternatives to turfgrass -- if you don't need to walk on your lawn often, then alternatives like native grasses (e.g. buffalo grass) and other species (such as clover) may be much more beneficial. They require less water, feed pollinators, and improve soil health. For lawns that are more heavily trafficked, clover can be mixed with turfgrass to get some of the same benefits. In smaller areas, herbs like thyme, mint, and oregano can be grown as alternative lawns, feeding both your family and pollinators.
- Choose the right variety if you keep turfgrass. Cool-season grasses like fescue, bluegrass, and ryegrass need lots of water, even in shady areas. Talk to your local OSU Extension Office to find what turfgrass varieties are the most heat and drought tolerant for your area and which will require the fewest additional inputs to produce a healthy lawn.