

Smart Mulching

BY RITA PELCZAR

There are proven benefits to using mulch in the garden, but it's important to choose the appropriate type and apply it properly.

ALTHOUGH mulching is a beneficial practice for nearly every garden, the characteristics of specific mulching materials, as well as geographical differences in soil and climate, need to be taken into consideration. Despite the many benefits it can provide, the overuse or misuse of mulch can do more harm than good. The bottom line is simply that some mulches are better suited for certain jobs and locations than others.

Many people view mulching primarily as an aesthetically pleasing way to put the finishing touches on a bed or to hide imperfections. Yet mulching provides many well-documented, practical benefits to the garden—retaining soil moisture, controlling weeds, preventing soil surface crusting and the resulting erosion, buffering soil temperatures, minimizing maintenance, and protecting plants from mowing injury.



Hardwood mulch not only benefits the ferns and other plants in this shaded garden, it provides a permeable surface for a sitting area.

Mulches generally fall into two categories: inorganic and organic. Inorganic mulches include gravel and stone; plastic—either black, clear, or the newer colored plastics; landscape fabrics, sometimes called geotextiles; and aluminized mulches.

For landscaping purposes, gravel and pebbles are particularly useful for weed control around plants that thrive in dry soils. Landscape fabric mulches are commonly used under more aesthetically pleasing organic mulches, such as shredded bark, to enhance weed control. However, many experts now recommend against using landscape fabric for weed control for myriad reasons, among them that some weeds grow through the film, making them even more difficult to control, and that the fabric hinders the ability of desired plants to spread and reseed. Plastic and aluminized mulches are usually reserved for vegetable gardens, where they can be laid between rows; these mulches eventually degrade and contribute to the waste stream.

Organic mulches include byproducts of the lumber industry such as chips, shavings, bark, and sawdust; other agricultural byproducts such as cocoa hulls, peanut shells, ground corncobs, and straw; and yard waste such as grass clippings, tree trimmings, leaf mold, pine needles, and compost.

A subset of organic mulches is living mulches or cover crops. These have traditionally been annual grasses or leguminous plants used by farmers and vegetable gardeners to prevent erosion, crowd out winter weeds, and return nitrogen to the soil.

CHOOSING A MULCH

When selecting a mulch, many factors come into play, including availability, cost, personal preference, the site to be mulched, and the nature of your soil and climate. In any one landscape, several different types of mulch may be needed to accomplish different goals.

Some organic mulches such as pine straw and oak leaf mold are acidic and will lower your soil's pH. Unless that is your objective, application of garden lime may be necessary to neutralize the soil reaction.

Environmental concerns may also influence mulch selection. For instance, the overuse of cypress mulch is depleting the natural stands of this ecologically important species in the southeastern United States (see "A Clear-Cut Problem," page 31).



Rock garden plants—like these gentians—do best in well-drained soil. An inorganic mulch such as pea gravel is ideal for species that thrive in this type of environment.

A REGIONAL APPROACH

Mulching practices vary from region to region, largely depending on the climate and the availability of different materials.

The Nebraska Statewide Arboretum in Lincoln uses only organic mulches. "We feel mulch is critical in this semi-arid region to retain moisture in the root zone—especially around young plants," says Justin Evertson, the arboretum's assistant director. "We never recommend plastic weed barrier or rock mulch. We feel those options have more problems than they

do benefits, and they also just don't look good in the landscape."

For Mary Deweese, principal architect and owner of Acorn Landscapes/Landscape Architecture in West St. Louis County, Missouri, shredded hardwood is the material of choice for ornamental plantings. "It is economical, the natural material blends well with most landscape schemes, and it breaks down to enrich the soil."

The mountain climate and topography at the Denver Botanic Gardens (DBG) demand a varied approach to mulching:



Straw is right at home in vegetable gardens—here also marking the path between rows.



Shredded leaves are a natural, and thrifty, choice for mulching a woodland garden.

both organic and inorganic mulches are used. According to Dan Johnson, curator of DBG's Native Plant Collections, some gardens, such as traditional perennial or shrub borders, "may be topdressed with compost or a composted fine bark mulch, to help maintain soil moisture, to improve soil texture over time, to enhance microbial activity, and to add nutrients." But inorganic mulches are preferred for rock

gardens and xeric gardens, notes Johnson, "where those plants benefit from quick-draining, quick-drying material near the crown of the plants."

"I often used pea gravel or a product called squeegee, which is half-way between pea gravel and sand," says Mike Kintgen, curator of the Alpine Collections at DBG. "Alpines and rock garden plants love this type of mulch along with western natives

and other xeric species from around the world. Organic mulches would cause some of these to rot," he adds.

Carol Bornstein, California native plant specialist and director of the Nature Gardens at the Natural History Museum of Los Angeles County, makes a similar observation about plants from Southern California's desert and chaparral plant communities. "Many of our native species naturally grow in areas with little organic matter either in or on the soil surface," she says, "therefore organic mulches should be used sparingly or not at all."

In Alaska and parts of the West another factor enters into the equation when selecting a mulch material: flammability. A bulletin from the Alaska Department of Natural Resources suggests using only nonflammable mulches within 30 feet of your home if you live in an area where wildfires are a threat.

MULCHING PLANTS WITH PLANTS

Another option for controlling weeds and preventing surface crusting and moisture loss is the use of living mulches. At DBG, living mulches are used in some areas, "especially in woodland settings, front of borders, sometimes in xeric settings to stabilize and cool the soil," says Johnson.

This is particularly worth considering if the area you want to cover is large. "Sometimes people expect too much from mulch," says Evertson, who sees many Nebraska gardeners mulching large beds with lots of open space between the plants. He encourages a combination of mulch and groundcovering plants to minimize open spaces and reduce weeds. "We believe that if we do things right we can use a palette of plants to cover the ground and get the added benefits of biodiversity," says Evertson. "But we still recommend using mulch around trees and shrubs and in open areas in perennial plantings."

WHEN TO MULCH

Mulch can be applied to bare soil at any time of the year. Maintaining a year-round mulch on ornamental beds is recommended in most regions.

In regions with cold winters, applying an organic mulch to beds in late fall or early winter prevents rapid freezing and thawing of the soil, and helps maintain even mois-

ture through the cold months. Keep mulch a couple of inches away from the base or crown of plants to discourage rot. Mulch can also be applied in spring after the soil warms to inhibit weeds and reduce soil evaporation and crusting. Depending on the material used, you may need to freshen your mulch during the growing season.

In mild-winter regions, organic mulches will need to be refreshed more often for year-round benefits. The University of Florida Extension Service advises maintaining a two- to three-inch layer of organic mulch around established trees, shrubs, and bedding plants. A two- to three-inch layer of inorganic mulch, such as crushed rock, is recommended by the Arizona Department of Water Resources for xeriscape gardens. These can be applied at any time



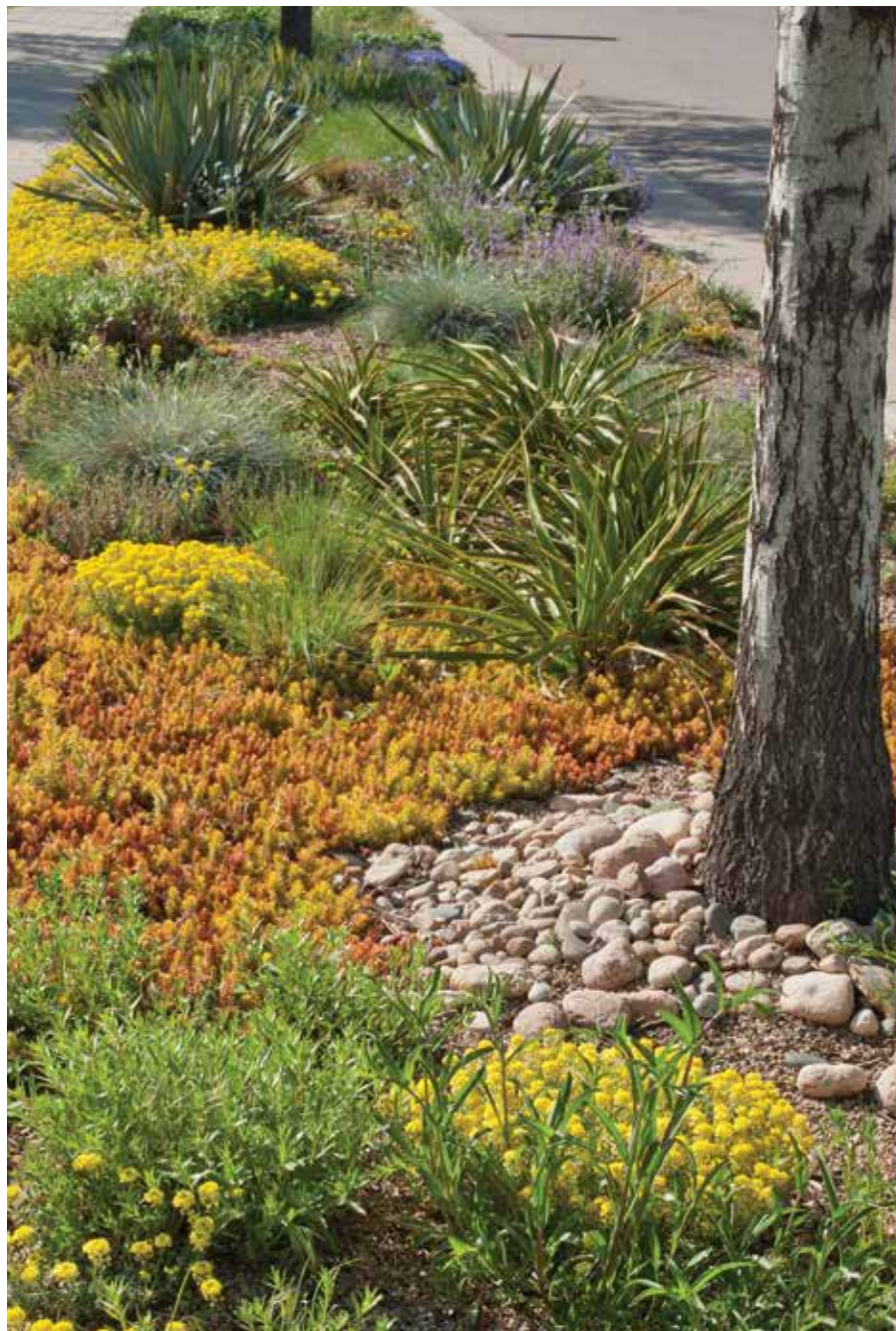
Above: Black plastic mulch helps warm the soil for heat-loving eggplant seedlings. **Right:** A thin layer of rock and gravel and closely grouping plants help conserve moisture in this Colorado xeriscape designed by Lauren Springer.

and don't break down, so will not need frequent replenishing.

For vegetable gardens in cooler regions black plastic mulch, laid over beds in early spring, helps warm the soil for early planting. Mulch applied between rows in spring will inhibit weeds and help maintain even soil moisture. In warm regions, mulches applied in vegetable gardens in spring help keep soil cool through summer.

MULCH MISTAKES AND PROBLEMS

Despite all the benefits of mulch, misuse or overuse can create serious problems. Perhaps the most common mistake is placing mulch



in direct contact with the crown, stem, or trunk of plants. This traps moisture and provides a favorable environment for bacteria and fungi that may promote diseases. Mulch that covers the base of a plant also encourages the development of shallow roots in the mulch layer, which are then subject to drying and damage. Keep mulch an inch away from the base of plants and avoid covering the crown of dormant perennials.

Applying too much mulch is another common mistake. "A lot of people seem to think that the more, the better," says Evertson. "Often we see mulch applied over eight inches deep and often in cone-shaped

piles around the base of trees." Thickly applied mulch can hinder the exchange of gases that occurs in trunk and root tissue and also affords shelter for potentially injurious insects, slugs, and rodents.

Most experts suggest applying between one and four inches of mulch, depending on the material. "Something that quickly decomposes could be used on the high side; something that mats or doesn't break down quickly should be used on the low side," explains Illinois State Master Gardener Coordinator Sandra Mason. Where you live also dictates how thick and how often to apply mulch:

In warm regions, mulch decomposes more rapidly than in cooler areas.

Dense mulches such as sawdust should be applied thinly—usually an inch deep—compared to a coarser material such as wood chips that might be used at a depth of two to four inches. “Sawdust decomposes quickly and can rob nitrogen from young seedlings. Either compost it first or only use on well-established plants such as mature trees,” says Mason.

BEWARE THE HUNGRY MICROBES

As they slowly decompose, sawdust, woodchips, and other organic mulches contribute nutrients to the soil. But when fresh organic mulches are applied around plants, a temporary nitrogen deficiency can result because the soil microorganisms responsible for decomposition of organic matter also require nitrogen. If they are unable to obtain sufficient nitrogen from the mulch, they take it from the underlying soil, resulting in a nitrogen deficiency in plants. Symptoms of this are yellowing leaves and stunted new growth.

The critical aspect of plant nutrition in mulch is the ratio of carbon to nitrogen (C:N ratio). Fresh organic matter has a higher level of carbon content than nitrogen. As the mulch decomposes and loses carbon, the relative amount of nitrogen increases and becomes more available. To avoid a nitrogen deficiency, use composted mulch or apply a topdressing of a nitrogen-rich fertilizer—one with a 10-5-5 nitrogen-potassium-phosphorus (NPK) ratio—prior to spreading the mulch.

TOXICITY

Cocoa hulls, a byproduct of the chocolate industry, have a fine, uniform texture, and a delicious fragrance. Unfortunately, dogs may be attracted to the scent, and the mulch, like chocolate, can be poisonous to them. “This is a real problem, according to our local University of Illinois vets,” says Mason, “especially with young dogs that tend to chew.” Homeowners with dogs are advised not to use cocoa hull mulch.

Some mulches can also be toxic to your plants. Never use grass clippings from a lawn that has recently been treated with an herbicide. And fresh grass clippings and unshredded leaves can form such a dense mat that they can suffocate roots and prevent water from penetrating.

A CLEAR-CUT PROBLEM

Mulch from bald cypress (*Taxodium distichum*) is popular with homeowners and landscapers especially in Florida. Attractive and relatively inexpensive, it is touted for its resistance to decay, but because most of the cypress mulch sold today is harvested from young trees—which contain little rot-resistant heartwood—the durability of the mulch is actually about the same as other wood mulches.

Cypress mulch is not without drawbacks, observes Wendy Wilber, Florida’s Statewide Master Gardener Coordinator. It turns a dingy gray within a few seasons and, when applied too thickly, tends to prevent water from soaking into the soil.



Bald cypresses are essential to wetland ecosystems in the southeastern U.S.

Yet the demand continues, and cypress swamps are being clear-cut to supply consumers with both mulch and lumber. According to a recent study conducted by the Southern Environmental Law Center, 60 percent of landscape mulch sold at Florida’s home and garden centers is cypress.

These slow-growing trees, a critical component of the wetlands ecosystem in the southeastern United States, are disappearing at an alarming rate. Producing cypress mulch “involves harvesting trees that have potential to provide long-term ecosystem services—water quality, carbon sequestration, habitat—to produce a product with a relatively short lifespan and that is an economically low-valued product,” says Michael Andreu, associate professor at the University of Florida School of Forest Resources and Conservation. For gardeners, there are better choices than

cypress mulch. “Pine bark is an excellent, more sustainable option,” says Andreu, “as it is a byproduct of the existing sawmill and pulp production operations.”

Another alternative that Andreu recommends is mulch derived from melaleuca or paperbark teatree (*Melaleuca quinquenervia*), a highly invasive species introduced from Australia early in the last century that is overwhelming stands of native plants. “Melaleuca mulch is great,” says Wilber. “It smells wonderful, it comes from a seriously invasive tree of the Everglades, and it has some claims to insect repellency.”

—R.P.

Certain plants secrete chemicals that inhibit the growth of other plants, a phenomenon known as allelopathy. Walnut trees (*Juglans* spp.) are known to be allelopathic, so their leaves and chipped branches should not be used as mulch. “Some people avoid using eucalyptus mulch because of its known allelopathic properties,” says Bornstein, “but this is more of a problem when trying to promote seed germination of desirable annuals.”

SMART MULCHING PAYS DIVIDENDS

As with most gardening efforts, paying attention to the nuances and details of

mulching will result in healthier, more productive plants and reduced maintenance. In the end, “the biggest mistake is not to mulch,” says Greg Armstrong, former director of the University of Wisconsin Arboretum in Madison. By matching the right mulch to your garden’s needs and using it properly, you can put the powerful benefits of mulch to work for you.

Rita Pelczar is a contributing editor of The American Gardener. This article is an updated version of the original published in the January/February 2003 issue of this magazine.