

Mulching is a practice that many gardeners learn to do by rote: an annual application, following rules with little regard to the various contexts they're in. But ecological gardeners amend soils and mulch only in response to the needs of the garden. We pay close attention to the plant communities, soil composition, weed pressure, and hydrology of a bed prior to mulching. We must also consider newer research on the benefits of not mulching, such as making space for the many soil dwelling organisms who can't penetrate shredded woodchips. But overall, we must trust in the natural processes of the plants we care for, allowing them to perform their seasonal behaviors, interfering only when necessary.

Herbaceous plant and deciduous trees do not throw their leaves away in autumn. They carefully place them on top of their root systems, where those leaves buffer temperatures, provide habitat for ground dwelling organisms, and slowly break down to create the next generation of soil. Leaves, old stems, rotten wood, are all methods through which plants create the soils they want to live in. When we micromanage the duff layer, raking out and topdressing, we can interrupt critical processes. So at Brooklyn Bridge Park, wherever and whenever possible, we "leave the leaves," as well as stems, twigs, and anything else the plants are inclined to put on the ground.

BBP MULCH PHILOSOPHY

- Mulch is placed only when necessary. We do not use mulch as a routine, seasonal application in all areas.
- Wherever possible, we use fallen plant material (leaves, stems) as a mulch rather than purchased material. This is important because plants use leaves and dead material to build the soil they need. Many organisms also live in the duff layer, and we are trying to encourage them.
- Mulch is less of a blanket to put on top of soils, and more of a constructed O horizon. It's future soil, a slow motion amendment. With few exceptions, mulch should be the sort of matrix your plants want to grow in.



BENEFITS OF MULCH

- *Moisture sequestration*

Mulch will reduce evaporation of water. This is especially important for new plantings.

Mulch moats can also help water stay in the root zone of a newly planted plant.

- *Thermoregulation*

Mulch stabilizes soil temperatures and buffers swings. It can keep soils cool in the heat of the summer and warm in winter.

- *Prevention of heaving*

For fall planted plants, plugs especially, heaving occurs when the ground freezes and thaws. New plants don't have the roots to hold themselves in place. Mulch can act as a weight that holds plants in the ground, as well as a buffer that reduces the freeze/thaw cycle.

- *Weed seed germination suppression*

As a weed suppressant, mulch is most effective at inhibiting the germination of seeds that require light. Any amount above an 1" should be enough to accomplish this.

- *Aesthetic*

Some gardens just look better when mulched. Formal beds should remain mulched at all times. Naturalistic beds are often improved by a clean edge of mulch.

- *Soil amendment*

The mulch you use should match the needs of the plants you are mulching: no wood chips on meadow plants, etc. It can take years, but mulch can affect pH, OM content, and fungal/bacterial ratios.

- *Minimization of compaction*

In areas where there is foot traffic (human or non, intended or not), mulch can reduce the compaction to the soil below it. Wood chips are especially effective.



DRAWBACKS OF MULCH

- *Can destroy existing duff ecosystem*

Raking existing duff most often precedes mulching, sometimes with a leaf blower that removes soil as well. This is destructive for the many organisms who live in that layer, like bumble bees, caterpillars and beetles, as well as the birds who forage there. The resulting flat-plane of applied mulch is a poor substitute for the many shelters and microclimates provided to tiny animals by leaves and sticks. In addition, raking out existing plant material interrupts the soil building processes of plants.

- *Can prevent / destroy habitat for ground nesting bees*

Many ground nesting bees require un-mulched soil. Some like duff but only when it's natural. Mulch can smother overwintering nests and prevent bees from making new ones.

- *Can form a matt*

Certain mulches break down in ways that form matts that prohibit gas exchange and moisture penetration. Always be on the lookout for this. Fallen leaves can also do this, especially waxy leaves that break down slowly (magnolia, oaks, etc) in soil with very slow nutrient cycling (like ours).

- *Can prevent light rain / irrigation from getting to soil and roots*

While mulch reduces evaporation from the soil, it also reduces water penetration from light rains and overhead irrigation, which can be a critical source of water for the plant's shallow roots hairs.

- *Can smother plants and make them miserable if done wrong*

Too much mulch on top of dormant spring ephemerals can block their spring emergence. Mulch on the crown of a perennial forb or grass can encourage crown rot. Mulch up against the trunk of shrubs or trees (volcano mulching) can cause the stems to rot as well. It's all worse when there's poor drainage.

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DRAWBACKS OF MULCH (*cont.*)

- *Can minimize subnivian zone for winter organisms*

A layer of air can form between the soil and snow cover that buffers freezing temperatures and provides an active winter environment for animals. These layers are best created on top of fallen leaves, as opposed to a uniform mulch blanket.

- *Can be ineffective at live weed reduction*

Anything less than a small mountain of mulch will fail to inhibit the growth of most of the living weeds we battle. At BBP, we ignore or outcompete most small, delicate weeds, like chickweed or speedwell. While the large weeds we prioritize (like mugwort) will burst through mulch easily. However, mulching after weeding is still important to inhibit sun-germinated weed seeds exposed by disturbance.

TYPES OF MULCH

- *Leaf mulch*

Leaf mulch is made of ground and partially composted leaves. Sometimes it gets blown away on windy sites, but tends to stay put on steeper slopes. It breaks down quickly, usually within a season. Sometimes weeds will grow in it. We use it in areas where we encourage bacterially dominated soils, like meadows, as well as areas with delicate plants that would have a hard time pushing up through anything heavier.

- *Triple ground mulch*

This mulch is finely ground whole trees and shrubs, and can be partially composted. It's the mulch we use most often in woodland ecosystems and lawn tree rings, with the hope that it encourages fungal, acidic soils. It breaks down slower than leaf mulch, is not as susceptible to being blown by the wind, and still tends to stay put on a slope. We look for mulch that does not form a matt as it breaks down and holds its dark color over time.

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TYPES OF MULCH (*cont.*)

- *Wood chips*

Woodchips are often overused by landscapers because they're easy to source and slow to break down. But very few plants want to grow in wood. At BBP, we use woodchips only on paths and for sheet-mulching. Because they are strong and break down slowly, woodchips are a great path substrate. They minimize compaction beneath them and suppress weed seed germination. We also use wood chips for sheet mulching: the weight helps smother grasses/weeds. However, woodchips will slide down a steeper slope.

- *Husks, pine mulch, etc.*

BBP has not had occasion to use these mulches. They seem like great options in certain ornamental contexts or where they are readily abundant.

- *Sheet Mulch*

Sheet mulch is a great option for killing a lawn or certain aggressive weeds. We use cardboard when we can find it but tend to buy ram board when we're up against serious thuggery. We scalp the site, place the ram board on top, soak it with water, and then apply 4" to 6" of woodchips on top. Mugwort and thistle can still make it though over time, but they are severely weakened and can be eradicated by pulling. Some people worry about the effect of sheet mulching on soil biology but we've found it to be a non-issue.

- *Green Mulch*

But why are we using mulch at all when we could be planting more plants? A fantastic option is to plant sedges and smaller, shade loving plants in the areas under trees and between larger perennials. A new campaign calls these green tree rings "soft landings" for the many butterfly species that spend their caterpillar phase eating leaves in the canopy, then fall to the ground to pupate. Soft plants, spaces to hide, and accessible soils can make all the difference.

- *Plastic and dyed mulch*

Just don't.



WHEN TO MULCH

- *Newly planted material*

All newly planted material should be mulched immediately, after it has been planted and watered thoroughly. Depending on the site, mulch should be 1-2" thick, leaf mulch or triple ground. Depending on the plant, a mulch moat can be constructed.

- *Edge condition*

Many beds, from meadows to woodlands to formal beds, look much better with a clean edge of mulch, especially in fall and spring. A wild bed can be given a frame and made to look intentional, and a woodland abutting a lawn can appear distinct. These edges should be 1-2" thick, are most often triple ground mulch, and extend about 1' into the bed.

- *Edge salt trap*

A thick layer of mulch along a bed edge can prevent salt from percolating into the soil column. This type of mulch should be removed and reapplied periodically. As a winter salt edge trap, mulch should be applied 2-3" thick, about 6" deep, at the beginning of winter, and then removed in spring, once snow fall risk has passed and before rains start. Spring cutback should include re-mulching that edge, where necessary, with 1-2" of mulch. Dog-oriented salt traps should be identical to the above but should be removed and reapplied every season.

- *Formal and entrance beds*

These beds should always be mulched. It's their look. A big mulching operation is usually necessary in fall, when beds are winterized, and then in spring, in areas that require cutback.

- *Weed germination suppression*

Sun-triggered weed seed germination can be stopped with 1" of mulch. Mulching after any soil disturbance (weeding, planting) can reduce weeds. Use the type of mulch best suited for the bed.

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WHEN TO MULCH (cont.)

- Soil/root/drip line protection

While some areas of exposed soil are fine, entire garden beds or large, visible areas should be mulched. Mulch is also helpful to stop erosion from wind, water, or gravity. Where erosion is a constant, mulch should be as well. When roots are exposed, soil, compost and mulch can be used to remedy the problem, but replant when necessary.

HOW TO MULCH

- *Never more than 3", most often 1" - 2"*

More than 3" of mulch can inhibit soil gas exchange, as well as prevent rainwater from draining down to the root zone, depending on the type of mulch used. Obviously, the coarser the mulch, the better the airflow. Rarely, it is good to use 4"-6" when sheet-mulching or moat-building, but in general, more than 3" of mulch is reserved for killing things rather than growing things.

- *Clean the crown*

Trunk and stem tissue is fundamentally different than root tissue. Root tissue, from trees to shrubs, to grasses, evolved to fend off invading soil organisms like fungi. The above ground tissue does not have these defenses and will rot if planted too deep or covered in mulch. The mulch makes a moist environment that encourages stem rot. It is critical to assure that mulch is cleared away from the crown (or base) of the plant, by a few inches.

- *Leave wood / stems on the ground*

When pruning or removing a tree or shrub, leave as much of the wood as possible on the ground layer. This is a critical part of building fungal communities in the soil, as rotting wood attracts and cultivates fungi for the individual tree species it came from. When pruning, leave sticks in short sections, on the ground as you cut. Logs should be artfully and subtly placed. However, all known or visibly diseased material should be removed from the site. Herbaceous material (stems, seed heads, leaves) should be managed similarly to wood: leave as much of the material you're cutting back in the bed as possible. The technique and amount varies by site, but can be accomplished by cutting forbs and grasses back in 6" segments, essentially mulching in place.



MULCH USE BY ECOSYSTEM AT BBP

- *Ornamental Gardens*

These beds can be found at our park entrances and playgrounds, welcoming people into the park with familiar aesthetics. They have a formal(ish) look: always neat. Winter herb material should only stay up if it looks good. Mulch should be applied in fall, over soil and leaves. If leaves covered in mulch look too bumpy, rake out prior to mulching. Mulch should be reapplied in spring if necessary.

- *Dense Hedgerow*

These are woodland edge ecosystems and the vast majority of them create enough organic matter to mulch themselves. Often we don't do anything. In newer areas, where leaves are slow to break down, or older areas with heavy leaf fall, we occasionally collect, process, and redistribute leaves to stop the smothering of herbaceous material. Mulch is most often used on newly planted plants and edges.

- *Lawns*

Obviously, lawns are not mulched but the tree rings in them are. We maintain clean lines for tree rings, expanding when necessary based on tree growth and design intent. Tree rings should always remain mulched and weeded. Edge lines stay clean. We use triple ground mulch, heavily: about 3". This is a great volunteer project for kids and others.

- *Meadows*

Meadows soils are lean and need to stay that way. We also tend to encourage seeding-in in meadows, so mulch is only applied when necessary. When meadows are cutback, we cut down herbaceous material in 6" segments, mulching plants in places. But we often remove much of it, leaving seed-heads for birds and seeding-in.

Duff from cutback is used for most mulch and removed when thicker than 3". Leaf mulch is used for newly planted material in low-wind scenarios.

