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Mulching for Healthier Landscape Plants

Why mulch?

Mulch is any material that is used to cover the soil for beneficial purposes. Plants growing in the forest are naturally mulched with a layer of fallen leaves, flowers, fruits, and branches. Most plant roots grow in the top 3 feet of the soil, and 80 percent or more of their fine, nutrient-absorbing roots are within the top 6 inches of the soil. Mulch protects these roots from drying and temperature extremes, and it enhances the soil conditions that improve plant growth and health.

Mulch helps reduce competition from grass and weeds around the base of landscape plants, resulting in improved growth, especially during establishment of new plantings. Grasses and weeds compete for water and nutrients, and some release chemicals that injure other plants. Research indicates that allowing turf to grow over tree root zones reduces tree growth. Mulch also can protect plants from possible injury from herbicide applied to surrounding turf.

Mulches improve the quality of the soil in the root zone by improving soil structure, especially by increasing porosity. When soil is porous, water easily enters and percolates through it. With good porosity, more water is absorbed and held in the soil, but drainage is also improved. Mulch protects the soil surface from becoming sealed by the impact of raindrops, keeping it "open." Mulch acts as a vapor barrier to prevent rapid evaporation of water from the soil, which is especially useful in areas prone to drought. Because mulching can improve water absorbtion and retention in the soil, irrigation water can be conserved and maintenance time can be reduced.

Organic mulches, as they decompose, contribute to the soil organic matter content. Organic matter improves soil structure and porosity by promoting soil aggregation. With improved soil structure, erosion and cracking—which breaks plant roots—are reduced. Soil organic matter also contains plant nutrients and provides food for beneficial soil microorganisms.

Trees and landscape beds are defined and accentuated by mulch, which enhances the design of a site and gives it a "finished" look. Mulches also assist landscape maintenance by providing a safety zone that protects planting beds, shrubs, and trees from lawnmower and weed-whacker damage.

Trees have extensive root systems. It is not practical to mulch the entire root zone of a mature tree, but a 3–12-foot circle of mulch surrounding a tree is easy to maintain and can be a pleasing addition to the landscape.

What material should you use?

Landscape mulches may be inorganic or organic. Common inorganic mulch materials are stones, crushed coral, gravel (such as "bluestone"), volcanic cinder, and lava rock. Inorganic materials protect the soil and may improve moisture absorption and retention, but they do not improve the soil to the extent that organic materials usually do.

Inorganic mulches are useful for areas such as paths and passageways, and they have a place in certain types of display gardens. They do not normally decompose or require replacement. Despite this, in general, inorganic materials are not recommended for mulching trees and landscape beds. Stones and gravel can be thrown by

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mowers, landscape equipment, or vandals. Some inorganic materials affect plant growth and vigor. Crushed coral, for example, is calcium carbonate (lime), which makes soil pH more alkaline, resulting in nutrient deficiencies and yellowing of pH-sensitive plants such as azalea, gardenia, and ixora.

Organic mulches are derived from living sources (see table, p. 4). The best ones are woody, fibrous waste materials that will degrade slowly and are in large enough pieces to allow for good air circulation. Mulches are usually graded by size: fine, medium, or coarse. Medium and coarse grades of organic mulch are excellent for use around plants. Suitable materials include shredded bark and coconut husks, wood chips, and macadamia husks; these materials may be partially composted before use. Coarse mulches will stay in place and don't easily blow or wash away. Fresh wood chips, such as those that are available from tree-trimming companies, can be used effectively. Add about ½ pound of 10-10-10 fertilizer per cubic yard of mulch.

Fine sawdust or freshly ground bark are less desirable than coarse materials because they have a lot of surface area for their volume, causing them to react with the soil, break down rapidly, and take nitrogen from the soil as they decompose. Fine materials require frequent replacement. They also can pack and form a barrier to air and water entering the root zone. The smaller particles blow or float away easily when dry. When mulching with fine or fresh materials, nitrogen fertilizer should be added to the mulch after application.

Compost is organic material that has been allowed to decompose. Mature ("finished") compost, unlike most mulch materials, is decomposed to the point where its components are no longer recognizable. Although mature compost has medium-fine texture, it will not tie up soil nitrogen like fine or fresh materials do. Mulching requires fairly large amounts of material, however, and mature compost may be better used mixed into the soil as a soil amendment. Many home gardeners compost trimmings from the kitchen, garden, or yard. Composts containing kitchen trimmings, weed seeds, or animal manures should be completely composted before being used as mulch.

Several companies in Hawaii recycle green residues by composting, and their products can be obtained in various stages of transition from raw mulch material to finished compost. Garden supply stores carry both local and imported mulch products. Local manufacturers are listed in the telephone directory under "Mulches" and "Soil Conditioners."

How much mulch is needed?

A mulch layer 3–4 inches deep is recommended for most situations in Hawaii. One cubic yard of mulch covers 80 square feet when applied 4 inches deep. To determine how much mulch is needed for a specific area, measure the area to be covered and use the following formula:

specific area to cover (in square feet) x depth of mulch desired (in inches) x 0.0031
= cubic yards of mulch required

For example, to cover an area of 100 square feet with 3 inches of mulch:

100 ft^2 x 3 inches mulch x 0.0031 = 0.93 yd^3 of mulch

If buying mulch in 1 cubic foot bags, multiply the above answer by 27 (27 ft^3 = 1 yd^3) to find the number of bags needed.

Mulch installation

Mulching landscape beds and planters

1. Mark off the desired bed area with string or tape to define the borders. Clear all undesired plants from the area within this border by your method of choice, such as hand-pulling, using a weeding tool, or applying herbicide.

2. A weed barrier such as commercial weed-cloth (woven polypropylene) or sheets of newspaper (black-ink only) can be put on the soil within the planter or bed before applying mulch. Do not use solid plastic, which keeps water and air from the root zone.

3. Spread a layer of mulch 3–4 inches deep within the bed or planter. Do not apply mulch more than 4 inches deep. Organic mulches that are too deep result in anaerobic decomposition, producing alcohols and other compounds that are potentially toxic to plants. Apply the mulch material to the surface beneath the plants but keep it 1–2 inches away from their stems. Leaving this small

Chunk bark mulch contained with a brick barrier in a planting bed gives the arrangement a rich contrast of textures.

Shredded bark mulch keeps grass-trimming equipment away from the bases of trees and creates a visual pattern.

unmulched border around plant stems reduces the potential for crown rot and other fungus or insect damage to the plants. Rake, lightly tamp, and water immediately after applying mulch to smooth out the material and remove air pockets.

4. Build up the outer edge of the circle of mulch slightly to prevent mulch from washing away. Even better, dig a shallow 2–3-inch trench around the outer edge and fill it to the surface level with the mulch. Alternatively, edgings made of plastic, wood, or metal can help keep mulch in place.

Mulching around trees

1. Make a circle around the base of the tree. Clear all plants from this circle. A minimum 3-foot radius of mulch is recommended around all trees up to 3 inches in trunk diameter planted in lawn areas. Increase the mulch radius by 1 foot for each inch of trunk diameter up to 12 inches. Be practical, however. Any size of mulched area aids growth and improves the appearance of the landscape. If you can only incorporate a 4-foot mulched area, that will be fine. It is not necessary to extend the radius all the way to a tree's dripline, which can cover an extensive area. A 12-foot mulch radius is sufficient for trees of any size, although from the tree's point of view, the mulched area can never be too large.

2. Follow the installation steps 2 and 3 as for mulching beds and planters, working within the circle beneath the tree. Using edging at the circumfrence of the mulched circle helps contain the mulch and keep grass from encroaching. Edgings can be plastic, wood, metal, concrete, or brick.

Organic mulch requires replenishing as it degrades, usually after 6–9 months in Hawaii. New mulch should be added regularly before bare spots appear to maintain the 3–4 inch depth.

By applying mulch around plants, you are imitating nature, recycling organic materials, and improving the soil conditions that favor root development and plant vigor. Mulch helps plants be healthy and long-lived, and it is an important tool for landscape enhancement.

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Organic mulch materials

Material	Life (replacement)	Availability	Notes
Shredded bark Partially composted green trimmings "Cover mulch"	6–9 months	Very good	Decomposes slowly. Attractive. Less prone to wash away than chunk bark or wood chips. Select partially composted material if possible.
Wood chips	6–9 months	Good	Medium size works best. Cools the soil, keeps weeds down. Add nitrogen if not aged.
Chunk bark (redwood or fir)	1–3 years	Good	Decomposes slowly. Coarse textured, shown to be superior to shredded bark for weed suppression.
Chipper debris	6–9 months	Good	A mix of shredded bark, wood chips, and leaves; available from tree-trimming operations. Rough, rustic appearance, good for natural-looking landscapes. Requires addition of nitrogen.
Sawdust and wood shavings	6 months	Limited	Decomposes rapidly, adding organic matter to soil. Will require additional nitrogen unless composted. Can float and blow.
Lawn clippings	1–3 months	Good	Dry out in thin layers on plastic or pavement for a day to avoid slime, smell, and flies. Tends to pack and repel water. Herbicide residues can be harmful. May contain weed seeds. Best left on lawn for turf mulching.
Sphagnum Peat moss	3–6 months	Good	Improves soil condition. Expensive. Has some plant nutrients but only slowly available to plants. Greatly increases soil water-holding capacity. Can increase soil acidity. Breaks down rapidly. impervious to water when dry, may not let water in when wet. Can blow in windy sites; erodes on slopes.
Compost	6–8 months	Good	Excellent at holding water in the soil. May be of more value as soil conditioner than as mulch. Before spreading, sift to remove all large, uncomposted pieces. Available in bags or bulk from local producers.

A circle of mulch around the tree can help avoid this unsightly display of carelessness. Bark damage caused by weed-whackers and mowing equipment can impair the growth of trees. Fungus diseases can infect the cuts. Scraping the tissues beneath the bark disrupts the tree's connection with its root system; complete girdling of the trunk can kill the tree.