

Mulches for Gardens and Landscapes

Cooperative Extension Service
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Guide H-121

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Mulch is any natural or synthetic material used to cover topsoil in the garden or home landscape. Mulches serve a number of purposes including

- reducing soil moisture evaporation,
- ensuring a more even soil moisture supply,
- reducing or preventing weed growth,
- insulating soil from extreme temperature changes,
- preventing mud from splashing on crop surfaces,
- reducing fruit rots (in melons, strawberries, and tomatoes),
- reducing soil crusting,
- reducing soil erosion,
- reducing soil compaction,
- protecting perennial plants from freezing, and
- improving neatness of the garden or landscape.

Organic mulches like grass clippings or compost also may serve as slow-release sources of nutrients for plant growth. Earthworms feeding on organic mulches not only will enrich the soil with their castings, but also will help aerate the soil. Organic mulches may, however, encourage some pests like sow bugs, snails, and slugs. Around fruit trees, avoid thick layers of organic mulches, which may shelter rodents.

MULCH EFFECTS ON TEMPERATURE

The time of year to apply a mulch depends on the type of mulch you wish to apply and your objectives.

Clear and black plastic mulches can be applied early in the spring to vegetable gardens to warm the soil. Black plastics are often preferred, as they will exclude light and discourage weed growth. Clear plastics are occasionally used to warm soils more rapidly and to solar-sterilize soils in the summer to kill weed seeds and disease organisms before planting.

Natural organic mulches and white plastic mulch applied in the summer will tend to cool soils. This is important for crops like strawberries, which do not tolerate extreme heat. Silver reflective mulches and aluminum foil not only cool soils, but also reflect light back under leaves, which tends to repel aphids.

Applying natural organic mulches in the garden in the fall before cold weather will help insulate the soil and extend the growing season. Potatoes, carrots, and parsnips can be stored in the ground during the fall and winter using a straw mulch to keep the soil from freezing. Straw placed around blackberry canes in the fall will help reduce winter kill problems.

Various rock mulches can be combined with underlying perforated plastics or landscape fabric (weed barrier) in desert landscapes. River rock and various colored lava and granite rock offer a number of color and texture options in the design of these landscapes. Reflected light from white rock under windows with western and southern exposures will help warm your house in the winter. Dark colored rock will retain heat in the landscape and may offer some frost protection (reradiated heat) for fruit trees in the spring (it also may encourage early breaking of dormancy).

APPLYING MULCH

Most coarse, natural organic mulches like straw, bark, and wood chips should be applied 2–3 inches deep over the whole area to be mulched. Grass clippings should be allowed to dry out before applying them to keep them from matting. Do not apply grass clippings over 1-inch deep. Woody material should not be incorporated into the soil, as it will tend to tie up nitrogen in the soil making it unavailable for plant

uptake. Do not allow moist organic mulches to come directly in contact with seedlings as they may cause seedling disease problems like “damping-off.” Mulches are generally applied to most crops after they have emerged or around transplants.

Plastic mulches should be perforated to allow air and water movement into the soil. Holes cut in unperforated plastic for vegetable transplants should be large enough to accommodate air and water movement around the bases of the plants.

Soil levels should be 1–3 inches below the level of sidewalks in desert landscapes where rock mulches are applied to help keep rocks contained. New plants in the landscape will have better access to water if the underlying landscape fabrics are sloped slightly toward the plants. Rocks and fabric may have to be replaced in the future if blowing sand accumulates allowing weeds to establish themselves.

TYPES OF MULCHES

The selection of a specific mulch will depend on its availability, cost, the crop to be mulched, and the season of the year. Almost any material that insulates well yet permits gaseous exchange and moisture penetration will make a satisfactory mulch. A good mulch should not need frequent renewal and should be non-toxic to plants, easy to apply, free from disease and weed seed, and not be so absorbent that it can take moisture away from plants. It should not pack, blow, wash, ferment, or burn easily.

Many commercially available mulches fulfill most of these criteria. Quite a few are inexpensive. Decorative barks and rock may be used for aesthetic value. A coarse, heavy mulch may be needed on a windy, hillside site.

A soil surface can be covered with either synthetic or natural mulches. Natural organic mulches will decay over time mixing in with the topsoil. Such mulches will improve soil structure, improving both water and air penetration into the soil. Synthetic and rock mulches will last longer and often require less maintenance.

Natural Materials

Bark - Bark offers outstanding effectiveness and appearance. It is available in fine, medium, and large sizes, although medium and coarse grades are best for mulch. Do not incorporate bark into the soil, as its high carbon content will cause nitrogen deficiency in plants.

Coffee grounds - This material has rich color and is high in nitrogen and some trace elements.

Compost - Use finished (well-cured) compost by itself or under other mulches. It can be mixed with soil before planting.

Corn cobs - Use medium ground, not fine, cobs. The cobs may be colored for special uses. Additional nitrogen may be necessary if corn cobs are mixed with soil.

Cornstalks - Cornstalks are very good shredded, or as whole stalks laid over other mulches in vegetable gardens. They are good for winter mulch.

Cover crop - Any crop, preferably a legume, that can be grown on spare land and cut can be used for mulch.

Grass clippings - Grass will mat and ferment if used fresh in a thick layer and alone, so only use it dry and in a thin layer. It is better mixed with other dry mulches. Do not use clippings if lawn has been treated with herbicides, and avoid grass like Bermuda that propagates easily.

Gravel, marble chips, crushed stone - Pea gravel or larger can be used over a weed barrier or alone. These mulches tend to warm the soil, so use them for heat-loving plants. Do not use marble around acid-soil loving plants.

Hay and field grass - Hay and field grass should be mowed before it goes to seed. Legume hays are rich in nitrogen. Loose hay will blow in wind and these mulches can carry weed seed.

Leafmold - This mulch is best placed around shrubs and on bare plots as leaves fall. Shred the leaves to keep them from packing.

Manure - Use well-rotted and strawy manure for best results, and watch out for weed seed. Use manure sparingly on vegetable gardens, roses, and other plants. Fresh manure can burn tender roots and can smell during the first couple of days after application.

Peatmoss - Fine-textured types dry out and crust badly; instead use chunky peat (sphagnum). Peatmoss is very expensive and hard to wet.

Peanut hulls - This is an excellent mulch and is very attractive. It blows in the wind unless partially cultivated into the soil.

Pecan shells - This long-lasting mulch has a nice color and good texture. However, birds and rodents

may become a problem, and it blows in wind unless partially cultivated into the soil.

Pine needles - Pine needles are a very good mulch, especially for acid-soil-loving plants (such as strawberries). Pine needles are light, airy, and attractive but can be a fire hazard.

Pomace (apple or grape) - The odor may be somewhat heavy for the first couple of weeks. This mulch is good for heavy soil and it decomposes very slowly and releases some nutrients to soil.

Sawdust (preferably decomposed) - Apply sawdust 1-inch deep, but do not incorporate it into the soil as its high carbon content will cause nitrogen deficiency in plants.

Straw - This is a good general mulch used for winter protection and on paths between vegetable rows. It may carry weed seed.

Wood chips - This is a long lasting mulch. Apply it 2–4 inches deep. It decomposes slowly. Do not incorporate into the soil as its high carbon content will cause nitrogen deficiency in plants.

NOTE: If plants mulched with high-carbon materials become chlorotic, additional nitrogen may need to be applied to plants.

Synthetic Mulches

Cloth - Burlap is sometimes used between rows in vegetable gardens.

Erosion-control netting and blankets - Use these materials for holding mulch and grass seedlings on steep slopes.

Fiberglass matting - This is a very effective mulch because it is permeable to air and water and its glass fibers may repel certain pests. Cover it with bark or similar organic mulch for better appearance.

Newspaper - Use three to six sheets thick and cover it with organic mulches for better appearance and to speed decomposition.

Perlite, vermiculite - Horticultural grades are useful around tiny seedlings or on plants in containers. It can blow badly.

Plastic film - These mulches are unattractive alone. For best results, plastic should be well perforated to allow aeration and moisture penetration. Clear plastic warms soil but permits weed growth, whereas black plastic warms soil and deters weed growth. White plastic cools soils and deters weed. Other colors are available and have various effects on plants. Silver reflective mulches (cool soil) reflect light, which tends to repel aphids (aluminum foil has a similar effect). Plastic is often used under rockscaping to discourage weed growth, but this is not recommended unless the plastic is perforated. Soil should be damp before applying plastic.

Woven weed barrier - This mulch allows moisture and oxygen to penetrate the soil, encouraging roots to penetrate more deeply. Use it in landscaping as a substitute for black plastic. It deters weed growth.

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