



University of Idaho
College of Agriculture

Cooperative Extension Service
Agricultural Experiment Station

Current Information Series No. 837

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APR 27 1989

UNIVERSITY OF IDAHO

Mulches for the Home Landscape and Garden

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A mulch is any material spread or left on the soil surface as a protective layer to serve one or more recognized functions. Mulches inhibit weed growth and therefore reduce the need for cultivation or herbicides. Mulches also conserve moisture by reducing evaporation, runoff and weed competition.

Mulches help maintain a more uniform soil temperature. Some mulches warm the soil in the spring to encourage early development and fruiting. Other mulches minimize soil-surface heating in the summer, which reduces stress and enhances growth. Soils remain warmer in the fall with mulch, which allows later fall plantings of bulbs, trees and shrubs. Soil freezing is delayed, which prolongs access to root crops stored where grown. In colder months, mulches reduce freeze-thaw cycles and frost heaving.

Many mulches reduce soil loss caused by wind and water erosion. They enhance the soil's physical properties by reducing compaction, preventing crusting, serving as a binding agent in sandy soils and improving aeration of soils high in clay.

Some mulches reduce leaching and keep mobile fertilizer nutrients such as nitrogen from being lost from the root zone. They may also provide major nutrients such as nitrogen, potassium, calcium, sulfur and phosphorus as well as trace elements. However, the fertilizer value of mulches is usually secondary to the beneficial physical impacts on the soil.

Mulches can reduce rot and soilborne diseases by providing a soil-free surface for vegetables and fruits. They enhance aesthetic qualities of gardens and landscaped areas and make them easier to maintain.

Types of Mulches

Sheet Mulches

Sheet mulches are relatively thin inert materials such as plastic or fiberglass. **Perforated or woven polypropylene** (landscape cloth or fabric) sheet mulch is

more durable than plastic, and it allows movement of air and water into soil. It controls weeds, maintains even soil temperatures and provides a clean resting place for fruits and vegetables. Unlike perforated or woven polypropylene, **spun polypropylene or polyester** allows light penetration and therefore weed growth. To overcome this, another mulch must be used on top.

Fiberglass mats are long-lasting and will not rot, corrode or burn. They are easy to apply, but they must be anchored. Fiberglass mats should preferably be used with a covering of loose mulch. Disadvantages of fiberglass include matting when wet and irritation of the skin. Fiberglass mats are not readily available in Idaho.

Foil mulches increase photosynthesis, conserve soil moisture and repel insects. They may, however, increase plant moisture loss through transpiration. They are unattractive and difficult to obtain in Idaho.

Newspapers or other paper mulches may be unsightly and can become matted or lumpy as they weather. Those containing colored ink may even be toxic to plants. Black paper may increase midday soil temperatures, while white paper moderates soil temperatures. Commercial paper mulches are designed to permit air and water penetration.

Black plastic is commonly used for vegetable gardens. It inhibits weed growth and warms the root and leaf environment in the spring to encourage early plant development and fruiting. This usually hastens maturity and increases total yields. Black plastic is good for heat-loving crops such as tomatoes, peppers and melons. It is also relatively inexpensive and readily available. Black plastic must be at least four mils thick and should be anchored in some way.

Clear plastic increases soil temperatures by 8° to 9°F more than black plastic with little inhibition of weed growth. Otherwise, clear plastic characteristics are similar to black plastic. It is commonly used for landscaping in combination with a loose mulch to prevent weed growth.

Since black or clear plastic may restrict water and air movement into the soil, these mulches should be used sparingly in most landscapes. An additional problem is that they become brittle and break up with age. When broken they are unsightly and ineffective. The remnants must be removed, unlike many loose mulches that can be worked into the soil. Plastic should not be used on steep slopes or on poorly drained soils. Avoid plastic use with azaleas, roses, rooting ground covers or any other planting beds that require irrigation.

Loose Mulches

Loose mulches can be any unconsolidated material applied to the soil surface. **Sawdust** is an attractive, readily available cover material. It decomposes slowly and can actually improve the physical properties of clay or sandy soils. It can be a good mulch for fruit trees, berries and some vegetables. Sawdust creates problems with matting, however, and must be broken up frequently. Nitrogen tie-up in the process of decomposition can also present a problem with fresh sawdust. Use well-rotted sawdust or mix the fresh sawdust with nitrogen fertilizer material. Some rotted sawdusts are very acidic. Cedar or walnut sawdust may be toxic to growing plants.

Wood chips have mulching characteristics similar to sawdust. Since they are larger pieces than sawdust, they decompose more slowly and they are therefore less likely to induce nitrogen deficiency. Chips about 3 inches in size are the least likely to compact. Wood shavings can also be used for mulching. Redwood and cedar shavings or shredded bark should be used with care since they contain material toxic to plants. This can be an advantage as the toxin can control weed growth.

Unlike many loose mulches, **bark** does not create a condition of nitrogen deficiency as it is highly resistant to decomposition. Spring applications are best, so that the new bark color will last. It is long-lasting and beautiful, yet may need to be reapplied periodically. Unfortunately, bark is often expensive, and it may provide a suitable environment for growth of windblown seeds. If shredded, compaction may be a problem.

Compost is an organic material derived from garden wastes, grass clippings and leaves. It has decomposed, under controlled conditions, to the point where it has a relatively stable carbon-to-nitrogen ratio. Used as a mulch, it enhances physical properties of the soil, increases water- and nutrient-holding capacity of the soil, adds plant nutrients and encourages development of soil organisms. Refer to University of Idaho CIS 679, *Making and Using Compost*, for detailed information on composting procedures.

If you use **lawn clippings** as a mulch, scatter them thinly and make new applications periodically. A thick layer causes excessive heat, provides a breeding place for flies and gnats and limits air and water penetration into the soil and root zone. Mixing lawn clippings with

other mulches prevents packing and enhances water entry into the soil. One disadvantage of the lawn clippings is the potential of the material to contain weed seeds. Grass clippings should not be used if herbicides have recently been applied to the lawn. Advantages of mulching with clippings are that they are readily available at no cost during the summer months, and they do add some nutrients to the soil.

Straw and hay can be used as a loose mulch. These materials are generally easy to obtain at a low price and are often used for winter protection or for mulching fruits and vegetables during the summer. They decompose slowly and are a good source of humus and some plant nutrients. Straw and hay present problems, however, because they have low nitrogen content and may harbor weed seeds, insects, diseases and rodents. Straw and hay also may be a fire hazard and can be aesthetically displeasing. Anchoring these materials with a wire mesh may be necessary to reduce losses to wind.

Sphagnum peat moss has a pleasing color, is free of weed seeds, can improve the physical characteristics of the soil and can provide nutrients. It is ideal for plants that grow best in acid soils (pH less than 6), for example, blueberries, rhododendrons and azaleas. The moisture levels must be regulated carefully, because the surface dries rapidly. Because of cost, peat moss is more appropriate for use as a soil amendment than as a mulch.

Crushed stone and gravel are sometimes used for landscaping. To prevent weed growth, they may be applied over black plastic. Rock materials such as marble and limestone can increase soil alkalinity, which may be a benefit in areas of acid soil. The benefits are primarily aesthetic, but availability and cost can also be advantageous. Disadvantages include heavy weight and high heat retention.

Pine needles are attractive and do not compact. However, in addition to presenting a fire hazard, needles increase soil acidity (decrease soil pH) and can induce nitrogen deficiency.

Deciduous leaves are readily available at no cost, and composted leaves may serve as a good soil amendment. Leaves are easily wind-blown, however. They can present a fire hazard when dry, and they tend to form slimy mats when wet. They are not generally an aesthetically pleasing mulching material. Leaves may harbor insects, diseases, weed seeds and even rodents. Oak leaves are acidic and maple leaves are alkaline. Leaves of walnut reportedly contain toxic substances and are unsuitable for mulching. All leaves should be dried or partially rotted before they are used as a mulch.

Manure can be used as a mulch and is also a good soil builder since it provides organic matter and nutrients. Manure mulches have several objectionable qualities, including odor and appearance, however. They decompose rapidly and must be composted or applied months before planting. Manure may contain weed

seeds and may also lead to disease and insect problems. Feedlot manure may have harmful levels of salts (sodium chloride).

General Guidelines For Using Mulches

You need to remove perennial weeds before applying a mulch. If you are using a loose mulch, such as bark, without a sheet mulch as a weed barrier, it may take several years to control perennial weeds.

The temperature needs of the plants to be grown and the characteristics of the mulching material must be considered before applying a mulch.

The particle size of the mulch should be much greater than that of the soil granules. The optimum depth of the mulch varies, but for most materials, a mulch depth between 2 and 4 inches is appropriate. Don't pack mulches against the trunks of trees and shrubs or the stems of plants.

When using loose mulches, make spring applications (1) after the plants are well-established or 4 to 6 inches tall, (2) when soil is moist, but not wet, and (3) when the soil has warmed enough for root growth, but before the weather becomes hot. Don't completely cover the plants. Reapply the mulch as the layer becomes thinner. For fall plantings, apply mulches immediately at planting. Layers of loose mulch should be thickest for winter protection of herbaceous plants.

Sheet mulches should be applied before planting. Best results will be obtained if the application is made when the soil has warmed and has a high moisture level.

Some mulches, such as straw, hay, pine needles, leaves and sawdust, are very low in nitrogen. If they are mixed into the soil, they tie up soil nitrogen and cause the plants to become nitrogen-deficient. These plants show poor plant growth and have light colored or yellowish-green foliage which first appears on the older leaves.

Loose mulches that have been used to provide winter protection for perennials should be removed promptly in spring to allow for more rapid soil warming. In a wet spring, all mulches left on the ground from the previous winter should be removed from the soil surface to allow the soil to dry.

Mulching Specific Types of Plants

Annual vegetable crops are commonly mulched with plastic. Loose mulch materials that will decompose by

the end of the growing season are sometimes used in conjunction with the plastic.

Strawberries can be mulched with compost in the spring. Winter mulching with a thick, insulating material such as straw, hay and leaves protects the roots. To prevent the early emergence of weak tender growth, heavy mulch layers should be gradually removed as the weather warms and soil temperature rises in late winter.

Roses grow better if a mulch is applied in the summer. In the winter, protection is achieved by mounding mulch material on the center of the plant. This mound should be discarded in the spring, when the temperature remains above freezing.

Garden bulbs can be protected from frost heaving by light mulching. Lilies benefit more from mulching than most bulbs. Mulches can provide an aesthetically pleasing background for flowering bulbs and also protect the flowers from mud splash. Summer mulching of annual flowers conserves moisture and reduces weed growth. Decomposed organic material is an effective mulch in this case.

A mulch should be applied when you plant **any tree or shrub**, as it provides a more favorable soil condition to help the plant become established. Coarse mulches are best for trees and shrubs, but the actual type of material used is not critical. Keep the mulch away from the plant stem to prevent pest problems related to excessive moisture. If fertilization of mulched woody plants is necessary, fertilizer can be applied to the surface of the mulch and moved into the soil with irrigation.

Trees and shrubs with shallow root systems or with a particular sensitivity to high soil temperatures or extended drought will benefit greatly from mulch application. Fruit trees benefit from mulches applied in the spring and removed in the fall (take care to avoid rodent damage). The mulch should be applied over a 3- to 4-foot radius around the base. Mulches protect evergreen trees and evergreen shrubs from winter drying. This can prevent severe injury or death. In this case the mulch should be applied to an area broader than the crown to adequately protect the root system.

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