



Mulches for the Home Vegetable Garden

Diane Relf, Retired Extension Specialist, Environmental Horticulture, Virginia Tech

Alan McDaniel, Extension Specialist, Horticulture, Virginia Tech

Reviewed by Dave Close, Consumer Horticulture and Master Gardener Specialist, Horticulture, Virginia Tech

Mulching is a practice adaptable to nearly all home gardens. To mulch is simply to cover the soil around plants with a protective material, organic or inorganic.

Using a mulch can help you and your garden in many ways. Mulches reduce weed growth by making conditions unfavorable for germination of weed seeds and by providing a physical barrier for emerging weeds. A good mulch layer can save many hours of laborious weeding. A thick layer of organic mulch material is especially effective in reducing the number of annual weeds in the garden, since they have difficulty penetrating such a layer. Some perennial weeds may also be suppressed in this way if they are small, but often dandelions or other taprooted weeds will eventually find their way through the mulch. These are easy to spot, and since the soil stays moist beneath the mulch, they are easy to pull. Rhizomatous grasses will often make their way through organic mulches as well, but often the rhizomes will be on or near the soil surface and will be easy to lift out. Black plastic and thick layers of newspaper are often better mulches for controlling perennial weeds.

Mulches are very useful for maintaining uniform moisture conditions in the garden. Water loss through evaporation is decreased, and soil erosion is decreased as the impact of a heavy rainfall is reduced by the layer of mulch. This allows a slow, steady water infiltration rather than the puddling and subsequent crusting which often occur with a heavy rain. Mulch also reduces splashing of soil onto the fruit, leaving fruits cleaner and helping to prevent the spread of disease.

Soil temperatures are modified by mulches to various degrees. Plastic mulches will warm the soil more quickly in the spring, increasing early plant development. Organic mulches act as insulation, helping keep soil temperatures cooler and, therefore, should be applied later in the season.

Organic mulches add nutrients and humus to the soil as they decompose, improving its tilth and moisture-holding capacity. Most organic mulches should be applied after plants are well established (4 to 6 inches tall). Cultivate out all weeds before spreading the mulch evenly over the bare soil between the plants. Apply organic mulches when there is reasonably good soil moisture and before the weather turns hot. Infiltration of rain water will be slowed somewhat by a mulch, so it is best not to place the mulch over soil that is dry. Water thoroughly or wait for a good soaking rainfall before applying any mulch.

Inorganic mulches, such as plastic films and paper, are applied prior to planting. Black plastic and similar materials should be spread on land that has been completely prepared for planting and has a high moisture level. Place the mulch over the row to be planted, then bury the edge to prevent it from blowing away. Cut slits for seeding or setting transplants. A few additional slits can be made to allow water to infiltrate.

Purpose, availability, cost, and final appearance of a mulch will be the determining factors in choosing which type to use. An evaluation of the more commonly used mulches follows.

Organic Mulches

Sawdust - A 2-inch layer of sawdust provides good weed control. If applied around growing plants, add 1/2 pound of actual nitrogen per 10 cubic feet of sawdust to prevent nutrient deficiencies. Fresh sawdust contains a great deal of carbon and very little nitrogen, and its breakdown requires that microorganisms take nitrogen from the soil. A very thin layer of sawdust (1/4 inch) is useful in starting seeds because it helps keep moisture in; again, be sure nutrients are adequate. There is often a problem with crusting of fresh sawdust,

Visit our website: www.ext.vt.edu

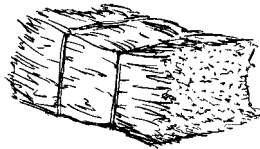
Produced by Virginia Cooperative Extension, Virginia Tech, 2020

Virginia Cooperative Extension programs and employment are open to all, regardless of age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, genetic information, veteran status, or any other basis protected by law. An equal opportunity/affirmative action employer. Issued in furtherance of Cooperative Extension work, Virginia Polytechnic Institute and State University, Virginia State University, and the U.S. Department of Agriculture cooperating. Edwin J. Jones, Director, Virginia Cooperative Extension, Virginia Tech, Blacksburg; M. Ray McKinnin, Administrator, 1890 Extension Program, Virginia State University, Petersburg.

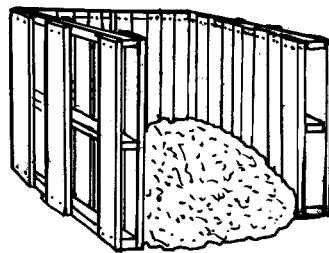
with resulting impermeability of rainfall. Sawdust is best used for garden paths and around permanent plantings. Readily available from sawmills, it tends to be inexpensive.

Hay or straw - A 6- to 8-inch layer of hay or straw provides good annual weed control. These materials decompose quickly and must be replenished to keep down weeds. They stay in place and will improve the soil as they decay. Avoid hay that is full of weed seed and brambles. Fresh legume hay, such as alfalfa, supplies nitrogen as it quickly breaks down. Hay and straw are readily available in rural areas, but city dwellers may not be able to obtain hay. Straw, on the other hand, may be purchased at most garden centers, often commanding a high price. Both are recommended for vegetable and fruit plantings.

Pine needles - Baled pine needles are also found in garden centers for use as a mulch. They make an excellent mulch around shrubs, trees, and in other areas where a long-lasting mulch is desired. Readily available.



Grass clippings - A 2-inch layer of grass clippings provides good weed control. Build up the layer gradually, using dry grass. A thick layer of green grass will give off excessive heat and foul odors rather than decompose as other organic material. However, in limited quantity, clippings will decompose rapidly and provide an extra dose of nitrogen to growing plants, as well as making fine humus. Avoid crabgrass and grass full of seed heads. Also, do not use clippings from lawns which have been treated that season with herbicide or a fertilizer/herbicide combination. Grass clippings may be used directly as mulch around vegetables or fruit plants, or they may be composted. They are an excellent source of nitrogen to heat up a compost pile, especially for those gardeners without access to manures.



Leaves - A layer of leaves, 2 to 3 inches thick after compaction, provides good annual weed control.

Leaves will decompose fairly quickly, are usually easy to obtain, attractive as a mulch, and will improve the soil once decomposed. To reduce blowing of dry leaves, allow to decompose partially. Highly recommended as a mulch.

Note: Leaves of the black walnut tree (*Juglans nigra*) are an exception due to the presence of juglone, a chemical that inhibits growth of many plants. While walnut roots and hulls cause most of the problems, the leaves also contain smaller quantities. Avoid using leaves collected from under black walnut trees as garden mulch. However, if leaves are obtained from a municipal collection source, the quantity of black walnut leaves likely will be diluted sufficiently that no injury should be observed. Several other nut trees also produce small quantities of juglone, and problems with sensitive plants are seldom seen even when growing under those tree canopies.

Peat moss - A 2- to 3-inch layer of peat moss will give fair to good weed control. However, peat tends to form a crust if used in layers thick enough to hold down weeds. It is very difficult to wet, and it tends to be blown away if applied dry. Peat is also a relatively expensive mulching material, probably more suitable for incorporation into the soil.

Compost - A 2- to 3-inch layer of compost is a fair weed control. Most compost, however, provides a good site for weed seeds to grow. It is probably better used by incorporating it into the soil since it is an excellent soil amendment. A layer of compost may be used on overwintering beds of perennials, such as asparagus or berries, to provide nutrients and help protect crowns.

Hulls and ground corncobs - A 2- to 4-inch layer of these materials will provide fair weed control, but both have a tendency to be easily blown by the wind. Peanut hulls will stay in place somewhat better. A heavier mulch, such as partially rotted hay or straw, may be used on top to hold down the lighter materials. Recommended if readily available in your area.

Bark and wood chips - A 2- to 3-inch layer of bark provides good weed control. Wood chips are slower to decay than shredded bark, and can be used as a pathway material in raised beds.

Inorganic Mulches

Black plastic - One layer of black plastic provides excellent weed control. It is relatively slow to decompose, but will be somewhat broken down by sunlight and must be replaced every two years at least. Black plastic mulch will increase the soil temperature by about 8°F in the spring. It may cause soil temperatures to rise too much in mid-summer, damaging the roots of plants unless a good foliage cover or organic mulch prevents direct absorption of sunlight. Check periodically to see that soil remains moist beneath the plastic; cut holes in it if water doesn't seem to be getting through. Black plastic is easy to obtain, but is fairly expensive. A new type of black plastic has recently come onto the market which has a white, reflective side to prevent the overheating problems experienced with solid black plastic. Another plastic is porous to allow penetration of water and exchange of gases between the soil and air.

Clear plastic - One layer of clear plastic will provide little weed control; in fact, it makes an excellent environment for growing weeds. This material is most often used to warm the soil temperature early in the spring to prepare an area for planting. It will raise the soil temperature by 10°F or more. Clear plastic is readily available and somewhat less expensive than black plastic.

Newspaper - Using 2 to 4 layers of newspaper provides good weed control. It decomposes within a season and is readily available and cheap. Cover with an organic mulch, such as sawdust or hay, to hold paper in place. Excellent for use in pathways and around newly set strawberry plants. Lead in printers' ink has been a concern of some gardeners desiring to use newspaper; however, printers no longer use lead compounds in ink for black and white newsprint, though colored inks may contain lead.

Red plastic - Developed and patented by scientists with the Agricultural Research Service and Clemson University, red plastic mulch boosted tomato yields in research plots up to 20 percent, while conserving water and controlling weeds. Red plastic mulch reflects onto plants higher amounts of certain growth-enhancing light waves from sunlight. In 3 years of ARS field

tests, red mulch boosted tomato size and weight by increasing the plant's growth above the ground—especially in the fruit. The scientists say the mulch can improve strawberry flavor by changing the fruit's chemistry. A colleague working with Kasperbauer is currently analyzing strawberries for sugars and organic acids. The ARS scientists say their research has focused on two color components of reflected light to enhance plant growth—the percentage of blue and the ratio of far-red to red. Red mulch has a low blue component and a high far-red to red ratio. Numerous garden supply catalogs carry this product.



Cover Crops and Green Manures

Cover crops, such as clover or rye, are not usually considered to be “mulch,” but fit the description in that they protect the ground and serve as soil enrichment when deteriorated. A cover crop is a temporary planting of a fast-growing crop, usually sown in the fall and tilled under in the spring, which protects the soil from wind and water erosion and adds organic matter. Crops grown for soil improvement are called green manure crops and are left in place for six months to a year. Legumes are especially efficient because they “fix” nitrogen from the air into the soil.

After the summer garden crops have been harvested, and stalks and vines removed, lightly till the garden to prepare a seed bed, incorporating lime and fertilizer, if necessary. Broadcast the cover crop seed, rake lightly to cover it, and then irrigate. Where you have fall crops growing, you can sow cover crop seed between rows a month or less before expected harvest, but not later than November 1.

If you plant a hardy species that survives the winter, it will resume growth as the weather begins to warm, but be careful not to let the crop go to seed. Cover crops and green manures are usually tilled under in the spring before planting vegetables. If the crop is tall or thick, cut it with a lawn mower prior to tilling - especially legumes as they may clog machinery. For large gardens, a rototiller is the most practical way to incorporate any type of crop. The crop should be turned under two to three weeks before planting new seed.