Mulches

Mulches for the Home Garden

A mulch is any material which covers the soil surface around and under plants to protect and improve the area. Traditionally, we think of mulch as an organic material such as leaves, straw or common plant remains. Our need for mulch, however, has grown. Two major reasons for mulching today are to conserve moisture and to create a better planting bed through the addition of organic matter. Additionally, the interest in recycling yard waste back into the landscape has promoted the idea that mulching our planting beds makes sense from a horticultural and environmental standpoint.

Forests go through a natural process of providing their own mulch. Leaves, evergreen needles and bark layer the forest floor to provide a covering of rich organic materials. This plant debris will decay over time recycling nutrients back into the soil, insulating it from heat and cold, conserving soil moisture and acting as a weed barrier. When we mulch our gardens, we simply follow nature's practice and receive all the benefits.

Ten Benefits of Using Mulch

1) Mulches help control weeds through prevention and slowing of weed seed germination.

2) Mulches regulate soil temperature by providing a layer of insulation over bare soil. How much regulation depends upon the type of mulches and in some cases, its thickness and color. The soil temperature may be either warmer or colder under mulch compared to bare soil.

3) Mulches assist in retention of soil moisture by reducing evaporation at the surface.

4) Mulches reduce soil erosion. A layer of mulch will lessen the impact and run-off of raindrops.

5) Mulches reduce the spread of disease by protecting above-ground plant parts from being splashed with fungal or bacterial inoculums from the soil. It also protects fruits from contacting the soil surface and in so doing, reduces the chance of rot.

6) Though generally in small amounts, most mulches will add some essential elements back into the soil.

7) Mulches improve soil tilth. As organic surface mulches decompose, they work down into the soil to increase air space, moisture retention and nutrient holding capacity.

8) Mulches reduce heaving of soils from frost. By loosening the soil structure, mulches lessen the tension between water molecules that form ice in the subsurface. Soil ice increases pressure which tears plant crowns and roots.

9) Mulches insulate against soil compaction. A cushion of organic materials on the soil surface will reduce the compaction of subsurface soil layers by absorbing the pressure due to traffic.

10) Mulches can improve the appearance of any planting site.

Types of Mulch

Organic Mulches

The majorities of mulches we use are organic in nature and represent materials which we recycle from our own yards. Garden centers, however, offer a wide assortment of different types of packaged organic mulches as well as some regional specialties such as rice hulls, walnut shells, peanut hulls or cocoa bean shells. The most common organic mulches include; peat or sphagnum moss, wood chips/shavings, sawdust, shredded/chipped bark, straw, hay, lawn clippings, pine needles or limbs, corn cobs, paper newsprint and leaves.

In summer, organic mulches tend to buffer soil temperatures by keeping the ground cooler in the daytime and warmer at night. In winter, they tend to keep the ground warmer and less subject to heaving. The real value to organic mulch is a continued addition of organic matter to the soil which improves soil structure and the quality of the root zone by opening up air spaces and stabilizing the soil moisture. At the end of the season, organic mulches can be left in place. Alternatively, synthetic mulches should be taken up after each growing season.

Synthetic Mulches

Synthetic mulches include clear or colored polyethylene plastic films and spun or woven polypropylenes, otherwise more commonly known as landscape fabrics. You could also include in this category carpet pieces and heavy duty aluminum foil which some people continue to use and can be quite effective in suppressing weeds and conserving moisture.

In contrast to organic mulches, synthetic mulches tend to keep the soil even warmer in summer because they magnify and trap the heat in the soil. The degree of heating depends upon the type of synthetic mulch and its color. Clear plastic warms the soil the greatest. Temperatures may reach about 10 degrees higher than bare soil in summer. Black plastic will raise the soil temperature about 5 degrees while other materials listed as synthetic mulches only elevate soil temperatures by 1-2 degrees.

Plastic mulches other than those which are clear, will enhance weed suppression and may increase yields of heat-loving crops like peppers, tomatoes and melons. They also retain more moisture than other mulch materials and for many gardeners are much more convenient to acquire and use.

One disadvantage of plastic mulch has to do with regulation of soil moisture. If a plastic mulch film is laid down on either wet or dry soil, this unfavorable soil moisture condition may prevail for a long period and eventually slow plant growth. In addition, plastic films have been criticized as potentially suffocating plant root systems, particularly of shallow-rooted woody plants like azalea and rhododendron. The plastic traps air and water and does not allow roots to breath. As a result, plastic mulches may create anaerobic conditions which produce gasses like methane from rotting plant debris buried in the soil. Methane is considered toxic to plant roots. For this reason, plastic mulch should be used only on a short-term basis

such as between vegetables or small fruit trees, but not on woody ornamentals like trees and shrubs. Plastic mulches should be removed at the end of the growing season. This may be difficult because they often partially decompose due to UV light from the sun, making them brittle and easily torn.

As a partial remedy to the problems with plastic mulches, a new synthetic material made from polypropylene or polyester has been developed. This material is permeable to air and water, but blocks light so that most broadleaf weeds are suppressed with the exception of very aggressive grasses and nutsedge. Landscape fabrics can be used around perennial plantings because they allow more air exchange in and out of the soil. They generally last for many years provided that they are covered with some other materials like bark chips or rock. In contrast to plastic films, landscape fabrics are easier to manage since fertilizers can still be applied by traditional methods and move through the fabric without difficulty. However, they generally cost more than plastic films.

Inorganic Mulches

Classified in this category of mulches are stones, gravels and other rock materials which can be used for the same purpose as organic and synthetic mulches. A layer of gravel or pebbles is often applied in areas where the most durable mulch is required. The disadvantages include poor weed control and an inability to add organic matter to the soil. It also does not allow for easy soil improvements. On the other hand, it is relatively inexpensive and should be considered a permanent mulch for woody planting beds.

Applying Mulches

Organic Mulch

Organic mulches should be placed around annual plantings only after the soil has warmed up in the spring. If they are applied too early, the soil will remain cold because it excludes the sunlight and this will slow plant growth. The best time to apply an organic mulch is after mid-May in the St. Louis area.

How much organic mulch to apply varies with the type used. Generally, a three-inch layer of compost, chipped or shredded bark or peat moss is sufficient to protect against moisture loss and temperature fluctuations in the summer. If hay or straw is being used, increase the layer depth to 4-6 inches. This material tends to be loose and packs down with time. Grass clippings provide another ready source of mulch, however, only a very thin layer of less than one inch should be applied around plants. Clippings which have not been mixed with other more coarse materials tend to mat down and with drying, they will become a strong barrier to water penetration repelling water away from the plant. The best procedure for using grass clippings is to first let them age by mixing with leaves, wood chips or some other brown plant debris for 2 to 4 weeks. The only real hazard to watch out for is to not use clippings which have been treated with broadleaf herbicide. Fresh clippings may retain active residue and affect the plants you mulch. This is especially true for tender and actively growing vegetables.

Vegetables grown from transplants should be mulched gradually beginning with a thin layer of about 1 inch and then building it up over a period of weeks to the three-inch depth. For vining-type vegetables like cucumber and squash, mulch a large area around each plant. As the fruit matures, the mulch will prevent contact with the soil which otherwise increases the chances of starting fungal or bacterial rots.

Organic mulches can also be used for perennials and small fruits to conserve moisture during the growing season and prevent winter damage due to freezing and thawing. Apply the mulch after the first frost about mid-November. Strawberry plants should be covered with 4 to 5 inches of straw in the fall. Similarly, rose canes cut back to 18 inches in the fall should be covered to a depth of about 8 inches with straw or similar material to protect the crowns.

Synthetic Mulch

Plastic layer mulches should be laid down at or before planting time. The real value of plastic is that it can warm a spring soil very quickly and this translates into early season planting. Before applying a plastic mulch, the soil should be fertilized and tilled. Once the plastic layer is in place, fertilization and soil moisture are more difficult to regulate. If this is a concern, making small cuts into the plastic may solve the problem. The best approach is to water the area and watch where the water collects in low areas. This is where the cut should be made.

After the sheet has been laid down, make a trench which parallels the planting row on each side. Place the edge of the plastic sheet into the trench and cover it with soil This prevents wind from tearing it out of the ground yet it can be removed with out much difficulty for clearing weeds or getting to the plant root system.

Some gardeners may wish to cover the entire planting surface prior to transplanting. In this case, holes must be punched in the sheeting in order to plant. This can be simply done with a knife, but should follow the basic rules of allowing enough room between rows and plants to work the area and reduce the competition for nutrients and moisture between root systems.

Unlike plastic sheets, landscape fabrics are typically woven and can last years. Replacement on an annual basis is not necessary as is recommended with plastic film. It is best to cover the fabric with rock, straw, or wood chips after it has been positioned. Blocking the sun means that UV light will not reach the synthetic mulch, make it brittle and more subject to tearing.

Mulch Types for Different Crops

Organic mulches tend to keep the soils relatively cool in the spring and these work best for raising cool-season crops like; beets, broccoli, cabbage, carrots, cauliflower, kohlrabi, lettuce, onions, peas, potatoes and spinach. On the other hand, synthetic mulches tend to warm and retain the warm condition of the soil. Therefore, they are best used with warm-season crops like tomato, pepper, squash, okra, peppers, pumpkin and eggplant.

The following chart gives some mulch materials which may be used in and around the home garden. Each has advantages and disadvantages worth noting. The one you choose should be readily available for a reasonable cost. One should also consider whether the mulch is needed for more than one season. Those which are more durable can be used with perennials and woody ornamentals.

A Guide to Mulching Materials for the Home Garden

Mulch Type	Advantages/Comments	Disadvantages	Duration
Bark (hardwood/pine)	slow to decompose; attractive; reusable	may hinder water penetration	1-2 years
Evergreen Tree Trimmings	readily available; inexpensive or free	need to clear out of beds in spring	1-2 years
Sawdust	good soil conditioner; decomposes quickly; slightly acidic; free	may deplete nitrogen in the soil	less than season
Pine Needles	slow to decompose; slightly acidic;	requires gloves to handle;	2-3 years

	suppresses weeds; lightweight; free of weed seeds; does not pack down; reusable	flammable when dry	
Straw	good insulator; lightweight; readily available; lightens soils when tilled in; useful when used around vegetables and as a cover for seeded lawns	generally not attractive; flammable; may deplete nitrogen	1 season
Grass Clippings	quickly decomposes; best if layered thinly, readily available; best to compost or age before using	depletes nitrogen at the soil surface; if applied too thickly, can dry and become a barrier to water, may become soggy and pack down; can carry weed seed; could contain herbicides	1 season
Leaves	good insulator; easy to transport; readily available; best if shredded; contains trace minerals; will work into soil to supply good organic matter; apply after soil has warmed	can become soggy and pack down restricting water flow	1 season
Newspaper	good barrier to weed seed germination; keep wet or cover with bark or other mulch; best used between vegetable rows; readily available	colored newsprint may contain lead; can blow away if not covered; unsightly in landscape setting	1 season
Cocoa Bean Hulls	attractive and fragrant; good soil conditioner; contains about 2 percent nitrogen	may be hard to obtain; expensive	1-2 years
Rice Hulls	slow to decompose; absorbent; good soil conditioner; best if composted first	requires additional mulch to hold it in place; may pack down and retard water penetration; may contain weed seeds	1-2 years
Corn Cobs or Stalks	moderately available; good weed control; supplies some nutrients	may heat up and compost in place	1 season
Cottonseed Hulls	adds nutrients to soil like cottonseed meal	can be blown about; needs to be topped with a layer of heavier mulching material; not readily available	1 season
Peat Moss	clean and free of weed seeds; improves water retention and soil tilth when tilled in; readily available; decomposes slowly	water penetration hindered if applied too thickly	1-2 years
Vermiculite or Perlite	sterile and free of weed seed; readily available	expensive; very light and may scatter in the wind or be washed away; can cake to inhibit water penetration	1-3 years
Nut Shells	slow to decompose; attractive; good soil conditioner; adds nutrients to the soil	sharp edges make it hard to work with; may not be readily available; expensive	1-2 years
Rock, Crushed	allows water to penetrate; long lasting	does not control weeds; non-	Permanent

Gravel or Marble Chips	permanent mulch; inexpensive; can be attractive	absorbent; adds no organic matter to soil; can become hot and affect root system of shallow-rooted plants; cannot cultivate soil	
Black/Clear Plastic	retains soil moisture; black provides effective weed control; warms soil quickly in spring; readily available and fairly easy to apply; best for vegetables but can be used in and around landscape plantings	non-permeable to air/water; can suffocate shallow-rooted plants; non-degradable; weeds grow under clear plastic; adds no nutrients; should be covered with other mulch materials to prevent UV radiation damage	1-2 years
Porous Plastic	allows water and air to move through; same as other plastics	degraded with exposure to the sun; should be top mulched to protect	1-2 years
Landscape Fabric	allows water and air to move through; durable; suppresses most weeds; good for landscape and perennial beds	some weeds can get started in fabric; should be covered by top mulch	1-3 years