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IMPROVING YOUR SOIL WITH ORGANIC MULCHES

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What are Mulches and Why Use Mulches?

A mulch is simply a layer of opaque material over the soil surface. Mulches can be organic or inorganic. Organic mulches include any material of natural origin that also decomposes naturally, such as bark chips, grass clippings, straw, leaves, compost, rice hulls, saw dust and grape pomace. Inorganic mulches include plastic sheeting, rocks, rubber chips, or non-woven geotextiles. Plastic sheeting and nonwoven geotextiles are usually used underneath (and held in place by) another type of mulch. All mulches help reduce evaporation and thereby conserve water in the soil. All mulches also reduce weeds. Controlling weeds helps plant growth -the growth of young trees, for example, can be reduced by 1/3 to 1/2 the first few years if weeds are allowed to compete with trees. Overall mulches help grow healthier plants requiring less maintenance.

Why Use *Organic* Mulches?

Organic mulches provide some significant benefits compared to inorganic mulches. Organic mulches benefit the soil because they contribute nutrients to soil and encourage growth of beneficial bacteria, fungi, and insect life (such as worms). Organic mulches benefit the total soil ecosystem, increasing the availability of nutrients, air, and water for plant roots. The increased biological activity also improves the structure (tilth) of your soil, and further increase the availability of nutrients for plants, either through direct bacterial action, or through fungi (mycorrhizae) acting as extensions of the plant's root system.

The increased presence of beneficial organisms in the soil also helps your plants by reducing and controlling all kinds of pests. Beneficial insects will prey on insect pests, and beneficial bacterial organisms will outcompete the disease bacteria. Organic mulches also:

- Help moderate soil temperatures, keeping soil a little warmer in winter, and cooler in summer
- Conserve water more effectively and allow water to infiltrate into the soil
- Reduce erosion
- Help the soil absorb larger quantities of rain
- Prevent rain from hitting the soil directly (this causes soil crusting, which makes it harder for seeds to germinate, and rain to penetrate in the future)
- Help reduce soil-borne diseases from splashing of rain or irrigation water, and
- Removes heavy metals from soils

The improved water retention created by mulch allows roots to extend and establish further compared to bare soil. Root development is greatest under organic mulches (compared to inorganic mulches and bare soil). Your soil is an ecosystem; organic mulches help feed the health of that ecosystem. Finally, many organic mulches are free, or very low cost.

How to Use Organic Mulches

When to Apply Mulches

Organic mulches are best applied to the soil in the late fall (after the soil has been saturated by the first heavy rains, or in the late spring (while there is still significant moisture in the soil, but the soil temperature has warmed somewhat).

Preparation

Before applying organic mulches, either mow down or remove weeds. Alternatively, you can put down a layer of plain cardboard or 4-6 pages of newspapers before spreading the mulch. This will not only control annual weeds, but help reduce perennial weeds. The cardboard and newspaper should be wetted thoroughly before the mulch is placed. They will decompose in place and also help feed worms and other soil organisms.

How Much to Apply

The type of mulch determines how thickly it should be applied, and how often it needs to be replenished. Typical recommended mulch thicknesses are 3 inches to 6 inches to ensure good control of annual weeds—the coarser the material, the more thickly it should be applied. Coarser mulches (e.g., bark chips) allow better water and air penetration, and typically last longer. The finer the mulch, the more quickly it will break down. Replenish your mulch when it has decreased in volume by half or more.

Other Things to Consider

Certain fine mulches, e.g., grass clippings and sawdust, can mat up and prevent water from getting through the mulch into the soil underneath. These mulches are great in areas where no plant growth is desired (e.g., pathways), but should be applied more thinly in planted areas. Keep all mulches at least 3 inches from tree trunks and shrubs; the moisture retained in the mulch can support decay organisms that may attack the bark of trees and shrubs.

Why Mulches Reduce Weeds

Weeds need light to germinate and grow. The proper thickness of mulch will prevent sunlight from reaching the soil, and thus prevent annual weeds from sprouting. Combined with newspaper or cardboard, as described above, mulches will also greatly reduce perennial weeds, because of the distance that perennial weeds have to grow to reach sunlight outside of the mulched area. Existing weeds are stressed because they are deprived of light. Coarse mulches are more effective than fine-textured mulches in reducing weeds. Mulching also reduces or eliminates the need to "turn" the soil, which means that fewer weed seeds are brought to the surface. Weeds that do root in the mulch or grow up through the mulch can be removed much more easily.

With regular mulching, you will enjoy the benefits of healthy soil and plants, reduced water use, and less weeding!

Things to Watch Out For

Weed Seeds

Make sure that your mulch is free of weed seeds. Avoid hay and compost that did not reach sufficiently high temperatures (compost made by the garbage companies reaches a much higher temporary than most home compost).

Insects

Organic mulches may attract sow bugs and pill bugs and earwigs, but are repellant to many other

insects. Control earwigs by catching them in rolled up newspapers, and sow and pill bugs with diatomaceous earth, or use a natural pesticide for both.

Pesticides and Diseases

Know the source of your mulch! Avoid using mulch that is contaminated with pesticides (e.g., the grass clippings from your pesticide-happy neighbor) or may contain disease organisms (e.g., wood chips from diseased trees).

References:

California Master Gardener Handbook, 2004. UC ANR Publication 3382

Cover Cropping in Vineyards: A Grower's Guide. UCANR Publication 3338

UCCE Central and South Coast Region, Center for Landscape and Urban Horticulture "Impact of Mulches in Landscape Plants."

USDA Natural Resource Conservation Service: Benefits of Mulch

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/home/?cid=nrcs143_023585