Benefits of Organic Mulch on Trees

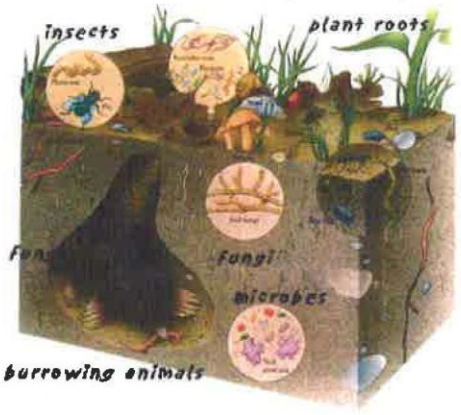
Ken Menzer & Heather Mayberry 8-12-14 kmenzer@folsom.ca.us

Trees require a healthy soil biome for growth. Organic matter added to garden soil improves the soil structure and feeds the microorganisms (fungi, bacteria, & microbes) and macro organisms (earthworms, insects, and burrowing animals). The more beneficial microorganisms your soil can support, the less bad organisms will survive. The beneficial's feed on harmful microbes like nematodes and certain soil borne diseases. They breakdown dead organic matter into the primary, secondary, and micro nutrients that all plants need for growth. They also release their nutrients into the soil when they die. So the more beneficial microorganisms that are in the soil, the more nutrients will be in the soil.

Organic mulch, with the help of beneficial microorganisms, breaks down and resupplies nutrients to the soil. The best organic mulch is hardwood or softwood chips in some cases, wood products, chipped and shredded pruning, and leaf material. They can improve water penetration, regulate soil temperature, and prevent soil erosion. Although many things can be used as mulch, organic mulches provide the greatest benefit to plants as they slowly increase soil nutrition.

Benefits of Organic Mulch.

1) Providing suitable conditions for an important symbiotic relationship between a beneficial soil fungus colony and the tree
2) Moisture retention
3) Reduced soil compaction
4) Maintaining optimal soil temperatures
5) Increased soil nutrition (natural fertilizers)
6) Reduction of weeds, disease, and pesticide use
7) Reduced wind and water erosion



Provides suitable conditions for symbiotic relationship between tree and fungus.

A special symbiotic relationship between fungi and tree roots is called **mycorrhiza.** As the tree makes sugar for the fungi via photosynthesis, the fungi grow and provide increased absorption of water and nutrients for the tree by injecting in into the tree's roots. Mycorrhizal fungi need moist, undisturbed soil with no grass. They naturally feed on the litter layer (aka: duff layer) under trees. Mulch is that litter layer and will help keep the soil moist.

Improved soil moisture.

Bare soil exposed to heat, wind, and compaction loses water through evaporation and is less able to absorb irrigation or rainfall due to compaction. Using mulch, the soil has greater water retention and reduced evaporation. Organic mulches conserve water more effectively and do not limit soil water infiltration and retention. Appropriate mulch can reduce the need for irrigation and in some landscapes can eliminate irrigation all together. Mulch can also protect trees and shrubs from some drought stress.

Reduced soil erosion.

Mulches protect soils from wind, water, traffic induced erosion, and compaction that directly contribute to root stress and poor plant health. Adding thin organic mulch will protect soils a little bit, 4"-6" installed depth is best! It is better to apply mulch before compaction occurs as it is difficult to reverse. Proactive mulching will protect soil integrity.

Maintenance of optimal soil temperatures.

Mulches have shown to lower soil temperatures in summer months and retain warmth in winter months extending the root growing season. Extreme temperatures can kill fine plant roots which can cause stress and root rot. Mulches protect soils from extreme temperatures, either cold or hot, just as insulation protects homes from extreme outside temperatures.

Not all fungus is good. A bad Oak Root Rot Fungus, ***Armillaria mellea*** is ubiquitous in our soils. It grows and colonizes (killing) roots when the soils are warm and moist. This warm & moist situation cannot happen naturally in the central valley of California. Either it is hot and dry or it is cool and wet...unless we irrigate on the hottest days. Solution: 1) irrigate on the coolest summer days and during the coolest part of the day or 2) reduce the temperature of the soil by adding 4-6" of mulch. This way some needed infrequent irrigation can occur during summer and it will do the most amount of good with the least amount of harm.

Increased soil nutrition.

Soil is not just dirt, it is living. Healthy soil is a combination of minerals, organic matter, water, air, and micro/macro organisms. Organic mulch will retain moisture in the soil and slowly breakdown adding organic matter to the soil. As organic matter accumulates it attracts worms and other soil microorganisms. Worms aerate

the soil and aid in water absorption as they tunnel through. Microorganisms such as fungi, bacteria, and invertebrates aid in the decomposition of dead matter naturally fertilizing the soil.

Improved plant establishment and growth.

Mulches are used to enhance the establishment of many woody and herbaceous species. Mulches enhance root establishment, transplant survival, and increase plant performance. Overall, mulches grow healthier landscape plants requiring less maintenance. The improved water retention created by mulch allows roots to extend and establish farther beyond the trunk compared to bare soil. Plants become stabilized sooner.

Reduction of disease.

Mulches will reduce the splashing of rain or irrigation water, which can carry spores of disease organisms to stems and leaves of plants. Populations of beneficial microbes that reduce soil pathogens can be increased with mulches. Mulches can combat disease organisms directly as well. Some plastic mulch can increase the incidence of disease by exacerbating already poor soil conditions, causing various types of rot and decay.

Reduction of weeds.

Using mulches for weed control is highly effective. Mulches can reduce seed germination of many weed species and reduce light, which stresses existing weeds. Coarse materials mixed with medium and fine chips are more effective than only fine textured ones in reducing weeds.

Reduced chemical use.

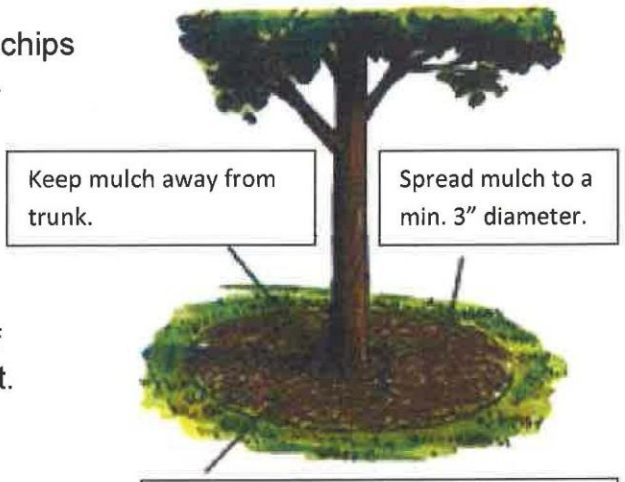
Mulches reduce weeds, plant stress, and susceptibility to pests and pathogens, which translates to reduced use of herbicides, insecticides, fungicides, and fertilizers.

Do:

*use organic, biodegradable substances. Best is hardwood chips from deciduous trees, it is like a slow time-released fertilizer. Spread 4"-6" thick (2"-3" settled).

*evenly spread 4"-6" thick without touching tree trunk. Mulch on trunks can cause rot and decay.

*if you get free tree grindings/chips from arborists, make sure the clippings are free of invasive seeds such as Tree of Heaven, Chinese Tallow Tree, Palm tree, Silk Tree, or Privet.



DO NOT use landscaping fabric, sheet or film mulches.

Sheet and film mulches encourage root growth on top of the mulch, injuring plants when removed. Plastic mulches can lead to increased mortality of transplanted material and cause extensive damage to fine root systems. These weed cloths kill earthworms, which would normally make long drainage and aeration holes in the soil.

DO NOT use plastic, rubber, or other inorganic substances.

DO NOT use Redwood and/or Cedar chips or shredded Cedar bark (AKA: "Gorilla Hair"). They breakdown too slowly.

DO NOT use chipped/ground bark next to public Right of Way as it tends to blow or get washed into our storm water drains.

DO NOT use cobbles, rock, decomposed granite, or limestone near Native oaks.

►Bottom line – All these benefits can NOT come from cobbles, rock, decomposed granite, rubber, plastic, Cedar, or Redwood. All of these benefits will ONLY come from hardwood chips.