



MULCHING AROUND - The New News

GENERAL BENEFITS

- Mulch is as much a part of gardening as soil, fertilizer, watering, planting and pruning. It is often even more important and beneficial.
- Mulch is applied to the surface of the soil, it conserves moisture, moderates soil temperature, controls weeds, maintains physical structure of the soil, and prevents soil erosion, ...just like leaf litter in a forest.
- Mulch can be organic (leaves, shredded bark, pine needles, straw, recycled ground wood waste or tree trimmings) or inorganic (stones, plastic film, aluminum foil). Organic mulches improve the soil while inorganic mulches do not.
- Mulch conserves moisture by blocking the sunlight and insulating the soil. When sunlight hits unmulched soil the soil heats up and speeds evaporation. Mulch shields the soil surface from wind slowing evaporation
- Studies have shown that a thick layer of mulch prevents rapid swings in soil temperature. The mulch buffers the temperature. Plants grow better when temperature is relatively constant, extremes or rapid changes in soil temperature halt root growth. Also prevents soil heaving in freezing temperatures.
- Saves a lot of work and time spent weeding. Many types of weed seeds need light to germinate. Mulch does not allow light to reach the soil surface hence the weed seeds do not germinate. Weeds that do germinate are easy to pull out.
- Over time organic mulches improve the fertility and physical structure of the soils they cover. As they decay they release the nutrients they hold (the original slow release fertilizer).
- Mulch helps prevent soil erosion. Rain (or sprinkler) droplets hit unprotected soil forcefully enough to shatter soil aggregates allowing the soil to wash away. A mulch

layer breaks the fall of water droplets and keeps the soil intact. It also prevents mud from splattering onto plant leaves (looks bad and might spread disease organisms), foundations and walks. Mulch slows the flow of water allowing it to soak into the soil and not runoff as waste. Mulch provides food and shelter for earthworms whose tunnels greatly increase absorption of rain by the soil preventing runoff and reducing erosion.

- Many insects such as cutworms must lay their eggs directly on the soil, having a thick mulch stops the reproductive cycle and reduces or prevents the pest.
- Mulches help prevent soil crusting thus increases in-soak and aeration. This is done by preventing moisture from moving up in the soil and evaporating in the air leaving behind the dissolved minerals as a crust.
- Organic mulches provide shelter for frogs, toads, lizards and other beneficial animals and insects. These animals and insects help control the bad insects.
- Organic mulches attract and provide food for earthworms. Earthworms are a valuable resource in the garden. Earthworms tunnel deep into the soil allowing air and water to easily reach plant roots. As mulch and soil pass through the earthworm they are transformed into castings that are rich in minerals that plants need. Many species of earthworms actually eat the bad microbes (fungi, bacteria, etc.) that are plant pathogens and in the process they also increase the good beneficial microbes. Chemicals in the earthworm cause the castings to form aggregates in the soil that are resistant to erosion. Some species of earthworms even eat many types of weed seeds.
- Compost is excellent mulch and contains microorganisms that help prevent damping off disease. The microorganisms in the compost are competitors of the pathogens such as Pythium and Rhizoctonia.
- Mulches increase the size and depth of the root zone of most plants.
- Provides walkways to keep feet from getting muddy.
- Decomposes slowly and helps to improve the condition of soil. A good mulch will



loose 2/3 of its volume be decomposition in one year's time along the Gulf coast improving the soil in the process.

- Organic mulches increase the organic acids (i.e. humic, fulvic, etc.) in the soil that help to release the nutrients contained in the soil.
- Organic mulches improve the appearance of any flowerbed or landscape.
- Bare ground, without mulch or plants is an invitation to weeds...nature abhors bare ground.
- Scientists from the Agricultural Research Service found that grass and leaf mulched plots had twice as many earthworms as those mulched with cornstalks. Water penetrated the earth-worm filled soil up to 4 times faster.
- Mulch helps trees withstand stress better. After the 1993 flood in the Midwest it was found that trees that were mulched and well established had the highest survival rate. Michael Hopps, Urban Forests, 1994
- If compost is applied as a mulch in winter, the dark color helps warm the soil by absorbing heat from the sun stimulating plant growth and the release of nutrients in the soil by microorganisms.

EXTRA BENEFITS OF NATIVE MULCHES!

- Native Mulch is the highest quality mulch available. It protects and improves soil better than other types. It also resists erosion better and protects the soil better than most mulch. Since it is made from recycled tree limbs it is also good for the environment.
- Scientists have found that mulch from shredded tree limbs does a better job of resisting soil compaction than plywood or any other traditional approaches. Course ground trimmings 6" or deeper to 18" can be used without hurting deciduous trees provided that the soil has good drainage. Morton Arboretum, Lisle, Illinois
- Mixed hardwood mulches or native mulches (not bark) encourage the growth of fungus



- fibers that glue mulch fragments together and to the soil thus preventing erosion.
- Mulches as they rot provide the preferred food of many insects and organisms whom eat plants if mulch is not available (i.e. they attack plants only if they cannot find enough natural food). Mulches made from natural wood materials are the best type.
 - Homeowners are advised that *natural wood chip mulches* attract other ant species that prey on the queens of imported Fire Ants. Avant Gardener, April 1994
 - Thick mulch made from ground plant material is home to billions of beneficial microbes. These microbes help digest the organic material releasing the nutrients and creating valuable humus in the process. Mulch also stimulates the growth of other microorganisms that release minerals stored in rock particles in the soil increasing soil fertility.
 - Mulches made from ground up tree and vegetative material is many times higher in nutrients than barks (i.e. pine bark). Native or natural mulches from recycled materials have a high percentage of buds, shoots, leaves, and cambium bark layers in them. These materials are rich in protein and other nutrients which is the reason deer and other animals eat them as a food source.
 - Mulches made from ground up tree and vegetative material tends to lock together (both physically and by fungus fibers) and not float off in a hard rain as most barks do.
 - Thick mulches made from ground up tree and vegetative material has many uses
 - they can be used to prevent injuries on playgrounds
 - they are used for jogging/hiking trails
 - powerful erosion control material
 - used as silt screens to filter runoff
 - Mulches in the shape of flakes or nuggets tend to wash away easily in heavy rains (i.e. pine bark). While fibrous native mulches tend to lock together and stay in place better.
 - Mulches that copy nature work best. Biodegraded mulch (i.e. composted) next to the soil surface with newer and less degraded material (fresh) on the surface. A variety of



- mulch particle sizes also works best (just like what occurs on a forest floor: leaves, twigs, limbs, and logs).
- Use of native mulches helps save valuable landfill space by recycling grass, leaves, trees limbs and other woody material that would otherwise be buried and wasted.
 - University of Tennessee research has shown that the use of loose or coarse mulches provides an environment attractive for beneficial spiders. These resident spiders were found to reduce insect damage 60-80%! None of the spiders attracted to test plots were poisonous, half were not web builders, and many were small and stayed out of sight. Texas Organic News, Vol II No. 2
 - Researchers have found that mulches made from yard waste (wood chips, grass and leaves) were the best type of mulch for Avocado and Citrus trees. The mulch increased the growth and health of the trees and encouraged the growth of beneficial microorganisms (biocontrol agents) that prevent soil borne diseases of these trees. Journal of Horticultural Science (1995) 70 (2) 315-332
 - Mulches made from recycled partially composted wood wastes that have lots of "fines" or small particles sizes are easier for worms to use (swallow and eat) increasing earthworm populations. The increased particle surface area of the small sizes also allows for greater microbial activity that is preferred by worms.
 - Research at the U.S. National Arboretum has found that large pile composting of wood waste eliminates (kills) the pathogenic fungus *Botryosphaeria dothidea*, a canker causing fungus known to infest Cercis (Redbuds), Rhododendrons (Azaleas), Syringa (Lilacs) and Prunus (Peaches, Plums, Cherries, etc.) species. It also found that similar pathogenic fungus is also killed by composting at temperatures over 122EF. **This method is also used for wood chips that line paths, in mulches and in soil amendments.** Nursery Management and Production, September, 1995.
 - According to *California Agriculture*, published by University of California, composted yard trimmings (lawn clippings and tree trimmings) applied as a mulch deserve credit for reducing brown rot disease in a San Joaquin Valley research plot. Adjacent plots treated with traditional composts and fertilizers. Compost amended trees had 0% brown rot and unamended control had 2.5% while the trees in the conventional grown plot had

- 24%. Fruit grown with compost had millions of yeast spores on the fruit surface which is believed to block or prevent brown spot. BioCycle, December 1995.
- Researchers at Auburn University have found that the type of mulch applied significantly affected yields of collards. The highest yields were obtained with a *native* wood chip mulch. HortScience, Vol. 31(5), September 1996
 - Experiments with *Gleditsia tricanthos inermis* ("Honey Locust") have found that destructive *necteria* cankers are greatly reduced when grown with a native mulch. Avant Gardener, 8/97.
 - Trees worldwide are having a decline problem that results in increased disease and pest problems and in eventual tree death. This problem has been linked to unhealthy soil caused by over use of synthetic chemicals and improper soil management. The recommended treatment is *composted wood and/or leaves* applied around the base of the tree. Dr. Alex Shigo, Tree Care Industry, October 1996.
 - Using mulch saves money (\$\$\$) both directly and indirectly. The US EPA says eroded sediments account for 80% of the pollution of the nation's streams. This cost billions of dollars in extra treatment of drinking water, infilling of water supplies, hydropower and flood control reservoirs, increased dredging of shipping channels, and other impacts too numerous to mention. This does not include destruction of wildlife habitat, lagoon, marsh and wetland destruction, or human health risks/costs. Erosion Control, Nov./Dec. 1995.
 - In Texas, it is estimated that we loose 4,000 pounds of humus per acre every year do to breakdown in the soil as a result of our high temperatures (Neil Sperry's Gardens, Nov.-Dec. 1996). Hence it is critical for soil health to keep it covered with a thick layer of mulch. Native mulches rapidly increase the humus content of soils.
 - Plants grown in substrates rich in **biodegradable** organic matter support microorganisms that induce systemic resistance to disease. American Nurseryman, October 1, 1997. Note: Composted Native Mulches have extremely high levels of beneficial microorganisms while bark mulches like Pine and Hardwood have chemicals that prevent/reduce biodegradability and even suppress beneficial microbes.
 - A 20 year study by the University of Quebec has found that native mulches improve soil



quality better and faster than any other material.

- **Mulches are extremely cheap for the benefits they provide.** *Studies have shown that if people whom use or specify synthetic, cancer causing, agricultural chemicals, who are destroying the soils, polluting the air and water, destroying our health, increasing erosion of our soils, etc. would take full responsibility for their actions, then the cost of using synthetic chemicals would cost hundreds to thousands of times more than natural techniques.*

The benefits, both cost and function, of mulches is so overwhelming that several states have now passed legislation requiring the use of mulches.

USEFUL REFERENCES:

The Mulch Book - A Complete Guide For Gardeners, Stu Campbell, Revised and updated by Donna Moore, Storey Publishing, Copyright 1991, ISBN 0-88266-659-2

The Rodale Book Of COMPOSTING, Deborah L. Martin and Grace Gershuny, Editors Rodale Press, Emmaus, Pennsylvania, Copyright 1992, ISBN 0-87857-990-7.

"Worm Composting and Mulches", EcoGardener, Acres, USA, March 1996

"The Many Benefits of Mulching", Malcolm Beck, Garden-Ville Inc., Copyright 1996

New research on the additional benefits and qualities of Native Mulches. Native Mulches are available from Nature's Way Resources, located at 101 Sherbrook Circle in the Woodlands area.