

MULCH CORNER

MULCHING PITFALLS PART THREE

By John Ferguson

Mulch made from fresh ground trees can also cause problems in some cases. In fresh wood there is an abundance of soluble carbon compounds that can accumulate in the soil as the fresh wood chips break down. Many beneficial microorganisms only antagonize or kill soil pathogens when they are stressed (i.e. must work for their food). These types of carbon compounds are like candy to the microbes. The microbes are busy eating hence do not have time to bother with pathogens.

While the good microbes are busy the pathogens can build up in the soil and are allowed to gain a foothold. Fresh mulches can also become slimy, hold too much moisture, and block airflow creating conditions for disease organisms to grow. Several universities have found these type effects are worse on soil low in organic matter, new landscapes, and compacted soil. This is another reason why composted mulches are more effective and are a better value than fresh mulches.

The exception is on heavy clay soils where the soil can lay fallow and undisturbed for many months to a year. In this case the microbes that break down the cellulose and lignin in the wood will also break down the clay into good loamy soil. Lavelle University in Quebec, funded by Canada's Department of Forestry has been doing research for decades on every continent on soil improvement with fresh ground native mulches. They found they improve soil quality better and at lower cost than any other technique, it just requires time for the microbes to work.

We sometimes see mulches advertised with phrases like, decay resistant, does not attract insects, will not grow mushrooms, etc. Translated this means those mulches have been treated with toxic synthetic chemicals (herbicides, pesticides, fungicides, etc.) to produce these effects. These type of mulches defeat many of the benefits that mulches provide, and the chemicals they contain pollute the environment and endanger human health.

Also, research from the USDA has found that if hairy vetch was killed with glyphosate (active ingredient in Round-Up TM) and then cut and used as a mulch, yields in some plants were reduced by 50% (HortScience, December 1997). Research at Michigan State University (published in same issue of HortScience) has found significant growth reduction on ornamental plants using pesticide treated grass clippings as a mulch with post emergent herbicides causing the most damage. It has been learned that most herbicides do not breakdown as previously believed, hence, we should not use mulch from plants or grass treated with herbicides (or pesticides and fungicides).

Research at North Carolina State University has shown that herbicide treated grass, when used as mulch, substantially reduces plant growth (80% for cucumbers, 65% for marigolds, 34% for salvias, etc.). Michigan State University has also published research on using pesticide treated grass clippings as a mulch and found significant growth reduction in all species planted (HortScience, Vol. 32(7):1216-1219, December 1997). Purdue University has expanded these studies and found that even growth regulators will persist for months and cause harm when these plants or leaves are used as mulch (Journal of Environmental Horticulture, vol. 15, no.4, December 1997).

Some media articles have talked about the danger of organic materials in agriculture and horticulture. While not a pitfall of mulches or compost, it is related to poor management practices in raising chickens and other livestock. Certain new types of diseases may be present in some types of organic matter and particularly in manures. A new strain of Escherichia coli, a bacterium that is normally benign or beneficial has been discovered that is extremely toxic. It has already caused severe illness and death across the country. It is known as E. coli O157:H7. As in all E. coli strains, it is easily destroyed by heat. This is another advantage of using any heat composted mulches (i.e. Composted Native), as E. coli is destroyed in a hot compost pile.

During the decay process various types of fungus may grow on the mulch surface. The artillery fungus (*Sphaerobolus stellatus*) is also known as the shotgun fungus since it can blast its spores 10-15' into the air. These spores are brown to black and very sticky, hence they can discolor light colored surfaces by sticking to them (Bird's nest fungus will also shoot its spores but not as far). If discoloration does occur, a soap and water solution will help to loosen the fungal spores so they can be scrubbed off. Most visible signs of fungus will naturally disappear as the mulch continues to decay into humus. The appearance of slime molds is distasteful to some people, however, the visible signs of this fungus is easily removed by periodically raking the mulch. These types of problems are much more common on mulch made from fresh or woody material rather than composted. They also are more common in thicker mulch layers (4-6" deep).



When using mulches we need to remember the area of the country we are in (i.e. weather and climate) and the type of soils and plants that are growing. Along the Gulf Coast a 3" thick mulch may be desired for most species, while in Arizona or New Mexico a organic mulch 3" thick may prevent the scant rainfall from reaching the soil or trap moisture around plants used to very dry soils (i.e. cactus) and increasing the possibility of disease. In drier areas perhaps only a 1-2" mulch would work better depending on the plant species and watering requirements. Another possible problem in very dry areas is the possibility of fire from a dropped cigarette or sparks from a fireplace or bar-b-que pit. Mulches like bark, shredded wood products, straw, pine needles, ground rubber and some plastics are easily ignited.

Another factor to remember is that hot moist climates have a much faster rate of organic matter decomposition and require more frequent mulching. In cooler climates, with long winters, the mulch will break down at a much slower rate. If you are not sure, you can contact the local county extension agent's office or the horticultural department at a nearby university for detailed advice for a given locality.

A few mulches have been shown to hurt plant growth (allopathic) these include black walnuts, eucalyptus (blue gum), tansy, wormwood, and French marigolds.

Black polyethylene roll type plastic mulches often look bad, absorb excessive heat (if not covered by an organic mulch) essentially cooking the root systems of most plants. In wet years the plastic often traps too much moisture in the root zone drowning plant roots and creating a breeding ground for disease. The perforated types often only work as a weed block if installed a certain way, and most need a large overlap of material to prevent roots/weeds from growing between layers. Also the use of plastic mulches creates indirect and hidden costs to society related to environmental issues, the direct cost of removal, collection and waste-disposal. Recent studies are finding that while plastic mulches help to obtain yields earlier in the season than bare ground, total yields over the entire season is often higher from bare ground.

Next week we will start looking at different types of mulch available in our garden centers and the pros and cons of each.