

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

By John Ferguson

We often hear “I need to order some pine straw mulch to acidify my soil.” This is one of those gardening myths that will not die.

Most pine trees have evolved to grow on and thrive on acidic soil, similar to azaleas and blueberries. They grow where the climate and soil are suitable. As one drives west from east Texas as the soil changes to more alkaline with higher salts, the pine trees fade away. Or if one drives south from Memorial Park where the soils tend to be acidic and as one crosses Buffalo Bayou and the soils become alkaline clays, the pine trees disappear. Most plants have a soil and environment they prefer or even require.

Pine needles themselves are slightly acidic but do not have the capacity to alter the soil acidity and are quickly neutralized as they decompose. When fungi first start to decompose pine needle they will produce some very weak organic acids, but again these quickly dissipate in the soil.

I did a test years ago where I covered an area four feet deep in pine straw and let it decompose over a couple years. There was no measurable change in the pH of the soil. The soil underneath was better that before, but by comparison, three inches of aged native mulch provided far more soil improvement than the 4 feet of pine straw.

Leaves are great for weed control and often work better than other types of mulch in this regard. However, leaves may blow around and be a little too messy for some. Pine straw does not blow and it is a little more expensive than other types of mulch.

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However, when used correctly and with the right species of plants it can be very beautiful.

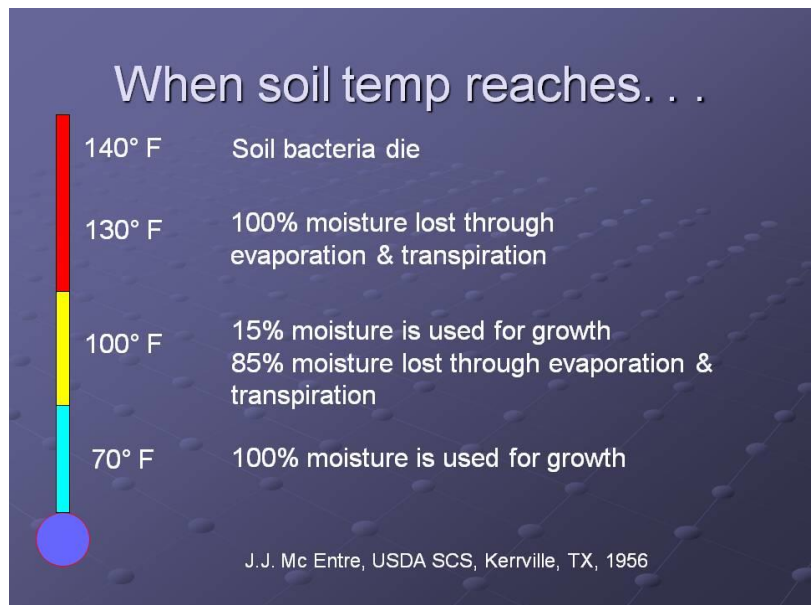
Pine straw also does a good job of reducing weed pressure IF it is thick enough (6 inches or more).

One item most gardeners does not often think about is soil temperature. As one can see from the USDA study below (chart), that when soil temperature gets above 70° soil moisture is no longer used for growth but used to cool the plant.

As the soil temperature rises, soil organisms from microarthropods to earthworms go deep into the soil. Many bacteria and fungi go dormant or at least greatly slow their metabolism.

These effects reduce the nutrient cycling they would normally provide, hence can lead to many problems from chlorosis to insect and disease.

Thus, keeping the soil well mulched protects the soil from getting hot, and a thick layer of pine straw does a good job of this.





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Another issue most gardeners do not think about is fire. Over the last few years there have been a lot of wildfires in the USA and thousands of homes destroyed across the country (ex. Bastrop, Texas 2011).

In many cases it was not the roof that caught fire, but the mulch in the landscape. The mulch ignited and then carried the fire up the flowerbed to the house. Often mulch is set on fire by burning embers from forest or grass fires brought in by the wind.

A few other fire ignition sources are:

- Cigarettes
- Sparks (fireplace, bar-b-que pit, fire pit)
- Embers (burning house or wildfire)
- Lightning
- Static Electricity
- Wiring (electrical shorts)
- Reflected heat from low-E windows
- Matches and lighters
- Broken bottles
- Spontaneous combustion
- Sparks from accidents

These other sources should be considered by designers and landscape architects when choosing a mulch if these sources are nearby and specify a fire resistant mulch.

Due to all the wildfires, several universities have begun testing mulches for their flammability. For the ignition tests the following was done:

- Propane Torch

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- Fifteen seconds of flame applied to each mulch sample then torch removed
- Test done one year after installation of mulch
- Tabulated the results
- Surprisingly even some of the organic mulches would not ignite

Summary of a few of the results on catching fire:

<input type="checkbox"/> OAT STRAW	VERY HIGH
<input type="checkbox"/> PINE STRAW	VERY HIGH
<input type="checkbox"/> GROUND RUBBER TIRES (DYED)	VERY HIGH
<input type="checkbox"/> DYED MULCH/PALLETS	VERY HIGH
<input type="checkbox"/> SHREDDED PINE, CYPRESS, or HARDWOOD bark	HIGH
<input type="checkbox"/> YARD COMPOST	MEDIUM
<input type="checkbox"/> PINE BARK CHUNKS-TWO SIZES	LOW
<input type="checkbox"/> TURF	VERY LOW
<input type="checkbox"/> COCOA HULLS	VERY LOW
<input type="checkbox"/> NATIVE MULCH (Composted/aged)	VERY LOW

Note: Rubber mulch was one of the worst of all. Ignition by even a small kitchen match on Rubber Chipped Mulch occurred every time in the demonstrations, along with the Dyed/colored and with shredded Hardwood Mulch.

Fire in Chipped Rubber Mulch gave off toxic fumes, could not be extinguished with water, in fact water spreads the flames and required beating out with a shovel to be extinguished.

I have a nice power point presentation I have used for many gardening events that covers all the many types of mulch, their good and bad points and allows me to go into a lot more detail.

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A recent article in Science News brought an environmental issue to my attention, the hidden cost of green technology. As a gardener I use a lot of cordless power tools that are powered by a lithium-based battery. Soil drills, chainsaw, pruners, hedge trimmers, blowers not to mention cell phones and electric vehicles, etc.

A very large part of the world's lithium supply comes from the countries of Chile, Bolivia, and Argentina from an area known as the Atacama Desert. This area is home to several flamingo species.

Being a desert, water is in short supply, and to mine one ton of lithium requires over 400,000 liters of water. The water in the salt flats grow cyanobacteria and algae that is food for the flamingos. As a result, the flamingo populations are declining.

Another article "The Environmental Downside of Electric Vehicles" had more detail. As gardeners we know that one of the best ways to fight climate change is to grow vegetation like trees.

According to the International Energy Agency (IEA), an electric vehicle requires six times the mineral inputs of a conventional car. They require nickel, lithium, cobalt, copper, rare earths like neodymium, dysprosium, etc. To acquire these metals requires a lot of strip mining where the rain forest must be cleared first and the topsoil removed. This mining releases a tremendous amount of greenhouse gasses. The mining also requires a lot of diesel-powered equipment that also generates greenhouse gasses.

Additionally, most of this mining occurs in third world countries where over 40,000 children are used for labor, the toxins released during this mining cause a lot of health issues for the miners. The promise of green energy is not as green as some have led us to believe.

I was thinking of purchasing a battery powered lawnmower and edger, after reading the articles I think I will stick to my old gasoline powered equipment as they still work fine.

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The Sustainable Pulse newsletter had a link to a new documentary “Into the Weeds”, on the dangers of glyphosate. The trailer can be seen on the link below.

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