SPECIAL *Gardening Update*

Mulch

You see it every weekend at the garden center and home improvement warehouses — gardeners and homeowners tossing bags and bags of mulch into the back of the family minivan, pickup truck or car trunk. Did you ever wonder why you mulch and where does the mulch come from? Which mulch is the best and why?

What Do Mulches Do?

Mulch is a material placed above the root zone of a plant primarily to conserve moisture and reduce weeds. But it is more than that. Mulch:

Reduces Soil Compaction
Reduces Soil Temperature
Increases Soil Texture

Mulch consists of dead leaves, twigs, fallen branches and other plant debris that accumulate on the earth's surface. Bacteria, fungi and other living organisms use these raw organic materials for food, a process we know as decay. In the natural scheme of things, decay is Nature's way of returning to the earth the raw materials borrowed by previous generations of plants.

Mulch insulates and protects soil from drying and hard-baking effects caused by evaporation of water from soil exposed to hot sun and winds. Mulched soils are cooler than non-mulched soils and have less fluctuation in soil temperature. Optimum soil temperatures and less moisture evaporation from the soil surface enable plants to grow evenly. Plant roots find a more favorable environment near the soil surface where air content and nutrient levels are conducive to good plant growth.

Mulches break the force of rain and irrigation water thereby preventing erosion, soil compaction and crusting. Mulched soils absorb water faster. Mulches prevent splashing of mud and certain plant disease organisms onto plants and flowers during rain or overhead irrigation. The mulch covering excludes light that prevents germination of many weed seeds. Fewer weeds provide less competition for available moisture and nutrients. Using mulches to control weeds is safer than applying herbicides or cultivating which can damage tender, newly formed roots.

Organic mulches not only conserve moisture, they also feed plants, earthworms, microbes and other beneficial soil life by composting at the moist earth surface. More species and tonnage of life occurs below than above the soil surface. All soil life needs energy. They cannot collect energy directly as green plants do but they feed on energy released from decaying mulch, their preferred food source.

Proper Use of Mulches

In garden beds planted every year, organic mulches can be incorporated into the soil each year to improve soil structure. New mulch is applied each year. One question with organic mulches dependent upon the state of decomposition is whether to add a nitrogen source to the mulch. Many fresh materials may require this to avoid nitrogen tie-up. The microbes decomposing untreated wood and bark use nitrogen. In this example some nitrogen must be added. Slow-release nitrogen fertilizers are much more effective. When required, nitrogen can be added at the rate of one-half pound of actual nitrogen per 10 cubic feet of material.

Organic Mulches

Tree Trimmings – Using local mulch (from tree trimmings) around plants has certain advantages over pine or hardwood bark. The content of the local mulch is much closer to the contents of rich compost.

Recycled Wooden Pallets – This is perhaps the best mulch on the market in terms of being environmentally sensitive. *Recycled* wooden pallets, once needlessly burned, are now being *reused* by being chipped through giant shredders, thereby *reducing* the need for other types of mulches. The staples/nails are removed and the resulting chips are sometimes colored. Make a note: if the colored chips are left on cement for more than a day, the colorant can bleed off the chips and stain the cement.

Bark (Pine) – Ground bark is available mostly from pine trees in sizes ranging from 2-inch chunks to a fine grind. It provides an attractive long-lasting cover and is usually reddish brown in color.

Grass clippings – These should be used only before grass seed has ripened, must be spread thin (two inches or less) and allowed to dry. If applied too thick they will build up heat and foul odors and become slimy during decomposition.

Compost – This dark colored material is easily spread and has slight nutrient value. It may be highly satisfactory where available from commercial producers or homeowners.

Peat Moss – Fine texture and good color are characteristic of peat moss, but it has a tendency to dry out and become impervious to water. It is costly to use in large quantities. Domestic peat moss may be so finely ground that it will blow away and is difficult to wet if it becomes dry. Water may run off rather than be absorbed by it.

Pine Needles – Needles are green when fresh, then turn reddish brown to gray upon drying, are long-lasting and supply nutrients as they decompose. Pine needles make attractive mulch that are good for acid-loving plants such as azaleas, gardenia, hydrangeas, and camellias.

Sawdust – If fresh sawdust is incorporated into the soil, supplemental nitrogen should be added to prevent nutrient deficiencies.

Shavings – Shavings last longer than sawdust and will not mat as badly, decompose rapidly, but blow away easily during strong winds. Wood chips mixed with shavings pull much nitrogen from soil. Nitrogen level must be increased.

Straw – Straw is coarser, more durable than most kinds of hay, and in most instances, is not attractive in ornamental plantings unless chopped. Straw requires applications of nitrogen because of its non-decomposed nature.

Wood Chips – In landscape operations wood chips offer a useful method for disposing of waste twigs and branches. It is good mulch, coarser than sawdust and less likely to cause nitrogen deficiency. Wood chips are long lasting, lie flat, and do not blow away easily in strong winds. Wood and bark from melaleuca is environmentally friendly and provides an ecologically safe method of disposing of melaleuca — a serious threat to the everglades and many areas in south Florida. Eucalyptus mulch is safe and in studies of short-term benefits has shown that its odor repels insects.

Inorganic Mulches

Inorganic materials used for mulches do not add nutrients to soil and do not decompose except after long exposure to weathering. Otherwise these materials are effective mulches, and several are permanent and quite attractive.

Crushed Rock – Crushed volcanic rock or stones are available in many colors or sizes and make a permanent cover. These materials are especially useful around plants subject to crown rot. Spread deeply, crushed rock can be walked on immediately after watering. Remember that white rock radiates sunlight and can create too much heat for most plants to survive. Black rock absorbs heat and can cause soil temperatures to be hotter than normal. A caution: Inorganic mulches of this type are exceedingly difficult to maintain and keep clean under pine or other very small-leafed evergreens.

Pea Gravel – Pea gravel is attractive permanent mulch. It is usually applied 2 to 4 inches deep and can be reused indefinitely. Pea gravel in various sizes is especially good for soil surface around plants in containers.

Plastic Film – Plastic film is used to cover vegetable beds. In ornamentals it is often used under gravel or stone mulches. It is not practical under sharp stones unless used with 1-inch layer of sand between soil and stones. Plastic is difficult to dispose of when used on large areas.

The Cypress Mulch Controversy

Cypress Mulch is the most sought after of all landscape mulches. For decades many do-it-yourself gardeners and professional landscapers

to add the final touch their landscape projects. Cypress trees, found only in wetland areas, are cut for both lumber and mulch, and are a disappearing natural resource in Florida's ecosystems.

Jerry Kidder, an extension soils specialist with the University of Florida's Institute of Food and Agricultural Sciences recently said "People need to realize that what they are using today is a very dear resource. Their kids won't get to see any big stands of cypress, because they'll all be cut."

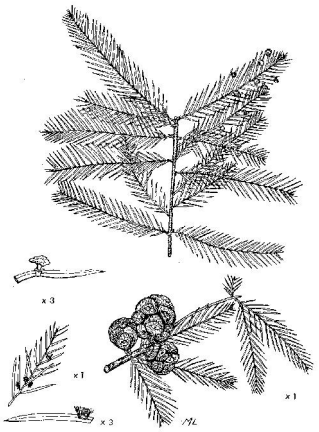

Figure 3. Baldcyprress leaves are flat and grow on both sides of horizontal branchlets.

All too often cypress mulch is specified in landscaping plans because it is seen as premium mulch. Many Florida residents are concerned about the use of cypress because they are slow-growing trees that only grow in freshwater swamps. They are not replanted as a crop like pine trees and are not an invasive, exotic tree like melaleuca, both of which could be used just as effectively for mulch. Some of the lumber waste used for the tremendous market for the mulch encourages cypress mulch. But it's not just the waste that is being used, it's also the new growth in the stands. Most cypress trees large enough to be cut for timber are at least 40 to 60 years old. While the softer edges and tops of the timber can be used to make mulch as a byproduct, a large consumer demand for the mulch also encourages the cutting of young, small trees. Once harvested, cypress trees don't regenerate quickly.

Susan Vince, a visiting assistant professor in UF/IFAS' School of Forest Resources and Conservation, said that clear-cutting is the most common logging practice used in cypress swamps, meaning that all the trees are cut regardless of size or age. Sometimes the larger trees are used for timber, but often all sizes of trees are fed into chippers for mulch production. Besides being prime habitat for woodpeckers, wood storks, several types of owls, opossums, bobcats and wood ducks, cypress swamps also help purify water by taking up nutrients. "It's important for people to realize that cypress swamps provide services that are important to society, like water storage, water quality enhancement and wildlife habitat," Vince said. "If swamps are intensively harvested over large areas, we may lose those important services of cypress swamps."

Gardeners often buy cypress mulch under an outdated assumption — that it is more durable and longer lasting. That belief is based on stories of the larger, old growth cypress trees harvested in the late 1800s and early 1900s, which are no longer found in the state. The heartwood of those older trees contained chemicals that acted as preservatives, resulting in greater wood durability and rot resistance. The younger trees cut today for mulch don't have the heartwood that those old trees had so today's cypress mulch is not likely to be longer lasting than any of the other mulches. Despite its dramatic appearance at the time of application, the softer wood used for cypress mulch fades fairly quickly and is washed away by rain. "The benefits of being a hardwood, such as termite resistance and durability, are short-lived, Kidder said. "Homeowners commonly use the cypress mulch, become unsatisfied with its attractiveness and buy more to replenish the area. Such a valuable byproduct just helps to create a larger market," Kidder said. "There lies our concern for the state's cypress supply. Large cypress stands could be found earlier this century, but they've been harvested. Both the trees and stands we have now are smaller, and we may never see large stands like that again."

Among the alternatives to cypress that can be used for mulch are melaleuca chips, pine nuggets and pine straw. The use of melaleuca would be wise, since it is an unyielding tree invading more than 500,000 acres of Florida's wetlands. Homeowners and professional landscapers should recycle waste already present in their properties, such as tree leaves, twigs and plant trimmings. Mulching is good, but it doesn't have to come out of a bag.

In a study funded by the UF/IFAS Energy Extension Service, horticulture extension agent Gary Brinen and other staff at the Alachua County Cooperative Extension Office compared the effectiveness of alternative mulches with that of cypress, studying 15 different kinds of landscaping mulches over a six-month period. The results of the research showed three alternative mulches — wood chips, pine bark and pine straw — rated just as high as cypress. Both landscape contractors and homeowners were involved with the study. All of the mulches faded over time, and the wood chips lasted longer while several others held up as well and looked just as nice over time as the cypress. Other recent UF/IFAS research has shown cypress mulch, when used in full sunlight can form a type of crust that restricts water movement and reduces the amount of

"In case no one except natives have noticed, our paradise has become a victim of its own allure as tens of thousands of people a year make Florida their permanent home and as millions of others visit our beaches, amusement parks and other entertainment venues.

Few contemporary trends illustrate Mark Derr's (author of Some Kind of Paradise: A Chronicle of Man and the Land in Florida) observation more than the coast-to-coast destruction of our cypress trees. Although these trees symbolize Florida almost as much as alligators and oranges, their disappearance, unlike that of mangrove trees, has gone virtually unreported. Exactly how important are cypress trees to the long-term health of Florida, the state with the most beautiful name? Second only to pines in sheer numbers, cypress occupy 1.6-million wetland acres and are essential for water purification, flood control and as habitat for wildlife.

Some cypress stands, especially those in the swamps, ponds and backwaters here in the southern region, are being wiped out to make room for housing developments and new municipalities. Even though cypress stands here are being destroyed to make way for buildings, most trees statewide are being cut for mulch. That is right: Our cypress trees are being reduced to mulch for flowerbeds. For many homeowners, in fact, cypress mulch is a horticultural must. Today, 85 percent of the trees are bagged as mulch. In assessing the extent of the devastation, a federal study shows that cypress harvesting has increased from about 19-million cubic feet in 1980 to 42-million cubic feet in 1995, an amount that would fill a 90-story bin the size of UF's Florida Field.

As if the uncontrolled harvesting is not bad enough, we are not regenerating trees fast enough to make up for the losses. "It warrants an alert," said Judy Hancock with the Florida chapter of the Sierra Club. "There's just major devastation going on. You can see it just rolling down the road."

We are fools to let this continue. "There are as many reasons for moving to Florida as there are people," Derr writes, "and the problem becomes less one of controlling the influx than of assuring that the state's prime resources are cared for and respected. Once used up and despoiled, it is paradise no more."

Used with permission, Bill Maxwell, St. Petersburg Times, February 28, 1999

water received by plant roots. No proof has been established on the prevention of pests by the hardwood cypress mulch, Brinen said, since all mulches are loose enough not to attract termites, which tend to stay in the ground or go to solid hardwood.

A recent study at the University of Florida compared mulches for landscape use. Here are some of the findings:

- Most nutrient laden mulch was that derived from utility trimmings. These trimmings include a significant amount of green material but are still less than 1% nitrogen. Pine straw also provides nutrients.
- Pine straw, pine bark, and cypress mulch are the most decomposition resistant mulches. These have significant lignin content that increases decay resistance.
- Aromatic compounds found in almost all mulches lead to an allelopathic affect. Pine straw and utility trimmings have the most allelopathic influences. Both suppress weed seed germination for at least one year while other mulches only suppress seed germination for 2-3 months. No research has been done to determine the allelopathic influence of these mulches on shrubs, bedding plants, etc in landscape beds.
- Mulches do lower the pH of underlying soil. Utility trimmings lowered pH the least in this study, followed by cypress mulch and pine bark mulch. Pine straw mulch lowered pH significantly more than the other mulches. These results were after one year of use and influenced the top 2-3" of soil.
- Pine bark retains original color better than other mulch materials