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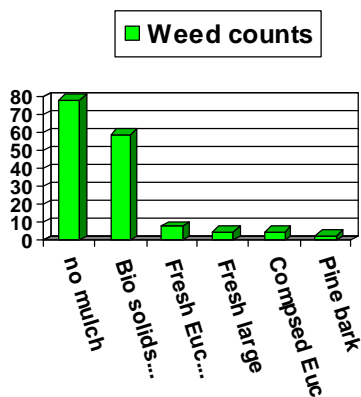
## Landscape Disease Symposium

This year we are running a bit early for the Landscape Disease symposium because I will be away for much of November. We are going to meet at the Camarillo House in Camarillo on Thursday October 14. This is a new venue for the LDS but I think you will like the newly renovated facilities and beautiful grounds which are also an important volunteer site for the Ventura County Master Gardener Program. This year we have a great Lineup of speakers with topics covering Armillaria control, Identifying mushrooms in the landscape, Huanglongbing Xylella, Laws and Regs, New pests and other subjects. We hope to offer over 6 CEU's for PCA/PCO and several arborist's hours. Lunch will be included, the fee will be modest, and the food fantastic. Hope to see you in Camarillo this year. For more program details or to register early, Please call Jim at 805-645-1458.

## Use of Mulches to Control Weeds in Landscapes

Mulches are materials placed on the soil surface. When used in landscapes, they serve both aesthetic and practical functions. Mulches can be organic or synthetic or mineral—mulches can even be composed of rubber or any material that does not easily degrade or harm the plants that grow under them. Mulches prevent evaporation from soil surfaces and thus will reduce moisture loss from soils. Organic mulches made from recycled greenwastes have the advantage of breaking down into mineral nutrients that plants can use and will also add carbon to soils thus improving their porosity, structure and microbiology (Downer, 2008). Organic mulches are also aesthetic if they are prepared in a uniform size by screening or fine chipping.

Recycling organic wastes back into landscapes is also beneficial to the environment as it reduces waste volume disposed in landfills. One of the most important functions of mulches is that they control the germination of weed seeds that require light to initiate their germination. Mulching can save thousands of dollars in weed control costs.



Organic mulches must have several characteristics in order to perform adequately in landscapes for weed control. Mulch particles must be of large enough so that the mulch layer does not hold more water than underlying soil

layers but not so large as to fail as a vapor barrier necessary to slow evaporation. Mulches must not hold enough water to allow seed germination, so particle must be larger than 1cm preferably 3-6 cm chips or larger. Mulches must have some longevity as it is expensive to reapply them frequently. Lignified organic materials such as wood and bark make the best mulching materials. Chopped tree branches or trimmings are excellent feedstock for mulch. Manures, composts, sawdust or other fine materials should be avoided. They may allow germination of weed seeds (Downer and Faber, 2005), and may contain weed contaminants (Daugovish et al., 2006). We found that in a study of mulches using a bio-solids compost that the weed suppression effects were lost in this treatment (Figure 1.). Mulches made from freshly chipped woody plants are best because decomposition has not begun and thus they have the maximum time available for breakdown. One of the disadvantages of using composted materials is that they have already been degraded in the composting process thus shortening their useful mulch life. There is no published evidence of chipped tree branches drawing the nitrogen from underlying soils. In time, mulch breaks down and eventually adds nitrogen to soil (Valenzuela-Solano et al.,2004). The thicker the mulch layer the greater the nutrient contribution (Faber et al., 2003).

### Effect of composting on Eucalyptus mulch weed suppression

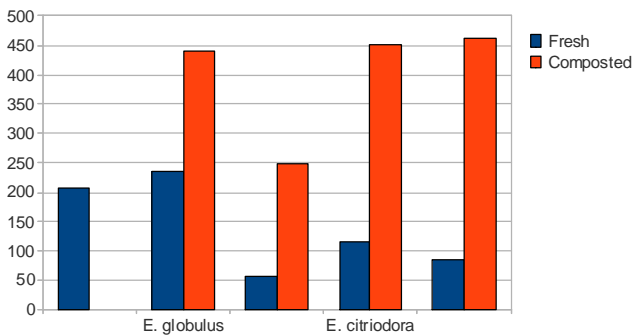


Figure 2. Downer, 1993

Yardwaste mulches made from Eucalyptus are common in municipal settings. Despite the popular fear of using Eucalyptus as a mulch, Eucalyptus mulches are safe for most horticultural applications and will promote growth of most plants under them. In a study of several different eucalyptus sources we found that different species of eucalyptus when made into mulch have different abilities to inhibit weed seed germination in flats (Figure 2.) *E. globulus* was the least suppressive to weeds while *E. sideroxylon* was very inhibitory to weed germination. When composted, the Eucalyptus mulches were stimulatory to weed seeds under them. Eucalyptus trees are known to contain allelochemicals that inhibit seedling germination; however the compost made from Eucalyptus leaves and small branches stimulated the germination and growth of weed seeds.

### Mulch thickness effect on weed density

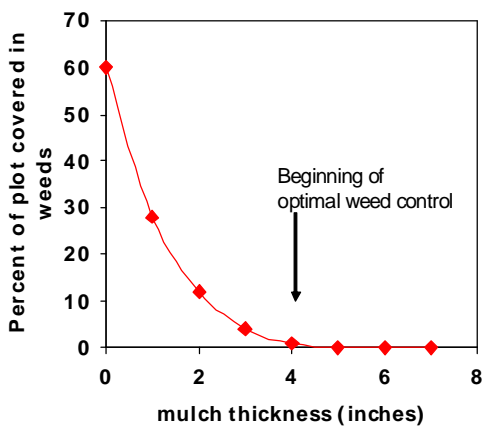


Figure 3. Optimal weed control with mulch

When these two eucalyptus species were tested as mulch in a field setting for their phytochemical potential, there were no significant differences between *E. globulus* and *E. sideroxylon* to inhibit a variety of weeds such as red root pigweed, malva, fillaree, smooth crabgrass and lambsquarters. In the same study, there was a very significant effect based on mulch thickness. As mulches of either source approach 4 inches in depth, almost 100% weed suppression can be attained of common annual weeds (Figure 3). The four inch depth was shown in a number of studies to inhibit most weed seed germination, probably from prevention of light breaking dormancy of the seeds. Mulches should be applied at greater depth than 4 inches because settling will result making shallower mulch depths a few weeks after application.

Some caution should be taken when applying organic mulches. Mulches can be the sources of noxious weeds such as yellow and purple nutsedge. We have shown that nutsedge can survive peak composting temperatures in yardwaste stockpiles of up to 70C for as many as 56 days (Daugovish et al. 2006).

Observations suggest that nutsedge is commonly spread in yardwastes and is frequently found invading landscapes from yardwaste mulched shrub and flower beds.

Mulches breakdown losing over sixty percent of their carbon each year (Figure 4). The decay curve for mulch loss in a landscape approximates the chart to the left. This is for an ideal wood chip mulch of large particle size. By the end of year two, the mulch has lost most of its thickness and ability to suppress weed seed

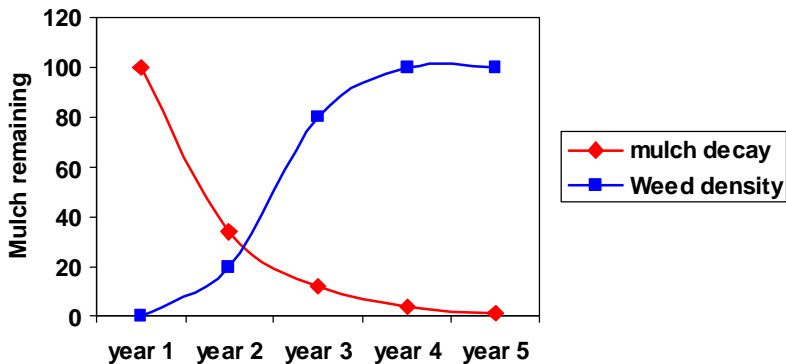
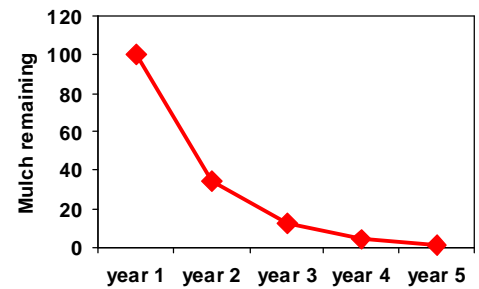


Figure 5. Weed emergence as a function of mulch disappearance

germination and weeds begin to build up. As mulch degrades it also builds up fine materials that store water and allow for germination. Mulch should be applied at least once per year in a 4 inch thick layer to account for decay and mineralization. If mulches are not replenished weeds will “escape” through the mulch and the weed control effects of the mulch will be lost as weeds grow through it, set seed and thus more weeds are produced. It is not uncommon for abandoned mulched areas to become 100% covered by weeds as the decayed mulch materials are nutritive and will now hold more water than unmulched surface soil layers (Figure 5).

Mulches can be used in landscapes to prevent establishment of annual weeds or perennial weeds that have not yet germinated. Mulches should consist of coarsely chopped tree wastes with a high content of wood. Application should be four inches or greater and mulches should be reapplied on an annual basis. Eucalyptus chips make excellent mulches and they have little or no phytochemical effects in field settings.

## References

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*This article is derived from a presentation given at the California Weed Science Society Meeting (February, 2010)*

## Hey Jim is on Facebook.



I know....You don't do social networking, right? Well here is a reason to take a look. I post current research findings and meeting announcements on Facebook because the medium is easy to up load to. The problem is, I could use a few more friends. So look for me and the latest in Landscape Research on Facebook at [www.facebook.com](http://www.facebook.com).

## Potting Media Studies

This year the Hansen Trust completed construction on its new greenhouse. It is a small facility but very suited to running small container studies. For several years I had evaluated container media available to retail consumers for their growing characteristics. This year I was able to resume study of these materials in the new greenhouse facility at the Hansen Agricultural Center. It is amazing to me that these products (Miracle Gro on the left Earth Gro on the right) can perform so differently given the same growing conditions. The plants are same age in the photo. The most limiting factor to most soils is nitrogen. Most of the potting media sold to consumers will not grow plants to acceptable quality without addition of fertilizer to the water or growing medium. In the photo neither container received fertilizer illustrating what severe nitrogen immobilization can do to plants. The impatiens in these containers are about ten weeks in each medium. A complete ranking of plant ratings and soils are summarized in table 1 below.



Table 1. Performance of impatiens in various retail potting mixes (August 2010)

Medium Name	Quality Rating <sup>1</sup> Aug	Ingredients <sup>2</sup>	Manufacturer
Scotts Premium PS	3.8bc	FPC, P, Pe,W	Scotts Inc.
Kellogg's Premium PS	2.2bc	FPC, FB, P, Pe, S	Kellogg Garden Products
Earthgrow PS	2.2bc	P, FPC,S, Pe, W	Hyponex Corp.
OSH PS	3.6bc	R,F,P,S, Pe,W	Sunland Garden Products
OSH Premium PS	3.4bc	P, R,F,Pe,S,Py,W	Sunland G.P.
Supersoil	3.0bc	P,FPC,W	Rod McLellan Co.
Black Gold PS	4.2b	P,C,Pe,Wc,W	Sun Gro Horticulture Inc.
Unigrow PS	4.2b	FPC,P, V,Pu,Ec	L&L Nursery Supply
Whitney Farms	4.0b	F,P,Pu,MC	Rod McLellan Co.
Miracle Gro PS with moisture control	8.2a	P,FCP, C,Pe,W	Scotts, Inc.
Miracle Gro PS	6.8b	FCP,P,Pe,W	Scotts, Inc.
Edna,s Best	2.0c	F,P,RC,MC,Pu,E,S, etc	E.B.Stone Inc.
Foxfarm Ocean Forest PS	5.4abc	FPC,P,E,Pe, etc	Foxfarm Soil and Fertilizers
Farmer's Organic PS	5.4abc	WP,P,Pe,S	Farmer's Fertilizer Co.
Schultz PS Plus	4.0bc	P,Pe,C,W	Schultz Co.
<sup>1</sup> Quality Ratings are 1=dead to 10 perfect florist's quality plants. Ratings followed by the same letter are not significantly different at 95% confidence intervals. Ratings are the average of five replications.			
<sup>2</sup> Potting soil ingredients as listed on the bag in order of appearance: FPC=forest products compost; P=peatmoss; Pe=perlite; W = wetting agent; S= sand; R=redwood products; F=fir products; Py = polyacrylamide polymer; C=compost; Pu=pumice; RC=redwood composts; M=manures and MC is manure composts			

Research on these and other media from past years has shown that adding 2grams of ammonium sulfate will make most of the media acceptable. Some media do not recover from added nitrogen. I have just applied N to ½ of the treatments in this study and will update you on that result in a few weeks.

## Hey its Conk Season Keep an eye on your palms!

It seems that conks are popping out everywhere right now. Most notable are the Ganodermas on many shade trees, mostly *G. applanatum* and *G. lucidum*. There are also a few unexpected fungi cropping up on Palms. Since *Ganoderma zonatum* only occurs on palms it is pretty easy to identify. If you see a palm with a conk on it, it is probably *G. zonatum*. The only problem is that this fungus is not supposed to be in California. What may be occurring is that palms are moved into an adjacent state like Arizona or Nevada and then shipped at a later time to California. The soil which originated in Florida can be contaminated or the disease can be in an early stage in the palm. Thus it can show up later in a California landscape when the palm now imported from Arizona is planted locally. *G. zonatum* survives in soil in Florida and in places where the a palm has died of the disease it is not recommended that palms be replanted as there is a high risk of infection from inoculums surviving in the soil. Unfortunately there are no methods to determine if a palm is infected with *Ganoderma* before the fruiting bodies occur that does not involve cutting the palm down and looking at the wood inside. The infection process for butt rot diseases is unknown. We do know that palms without visible wounds or

injury become infected and that wounded palms don't seem to be any more susceptible than unwounded ones.



Little is known about predisposing factors for infection. We do know that in sites where palms have died, it is likely that replants will die. The palm pictured above is a replant. We did not see the palm that was there before. This is a very serious disease and somewhat new to California. I am interested to find more specimens so please let me know if you have seen anything like it. You can call me at 805-645-1458 or send me an email at [ajdowner@ucdavis.edu](mailto:ajdowner@ucdavis.edu)

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