

Landscape Mulches: How Quickly Do They Settle?¹

Mary L. Duryea and Patrick J. Minogue²



Credits: Jim Mills/iStock/Thinkstock, © Jim Mills

Mulches are an increasingly important part of the Florida urban landscape. Mulches are known to buffer soil temperature, prevent water loss from evaporation, and reduce erosion. Weed control either by inhibiting weed germination or suppressing weed growth is another benefit of mulches. These advantages and the increasing interest in mulching have resulted in a wide array of mulches available for the gardener and landscaper.

Many questions emerge about the additional benefits of these various mulches. One common question is which mulch settles the soonest and needs to be replaced? Settling or subsidence is the packing down and/or thinning of mulches with time. Mulch subsidence is a concern for landscapers because as mulch settles its benefits such as

weed control diminish, and it needs to be replenished or replaced. This article is one of a series of fact sheets, which compare six common Florida landscape mulches (Duryea et al. 1999; Duryea et al. 1999).

The Study

In this study six landscape mulches were compared:

- Cypress (bark and wood from *Taxodium distichum* [L.] Rich. and *Taxodium distichum* var. *nutans* [Ait.] Sweet)
- Eucalyptus (bark and wood from *Eucalyptus grandis* W. Hill ex Maiden)
- Melaleuca (bark and wood from *Melaleuca quinquenervia* [Cav.] S.T. Blake)
- Pine-bark (bark with some wood from *Pinus elliottii* [Engelm.] and *Pinus taeda* [L.]
- Pine-straw (needles from *Pinus elliottii* Engelm.)
- Gainesville Regional Utility (GRU) mulch containing utility-prunings (leaves, wood, and bark) from oaks (*Quercus laurifolia* Michx., *Quercus rubra* [L.], and *Quercus virginiana* Mill.) and cherry (*Prunus serotina* Ehrh.), with a small amount of cedar (*Juniperus silicicola* [Small] Bailey) and southern pines (*Pinus* spp.).

All mulches (except the GRU utility-pruning mulch) were purchased at garden stores in Gainesville, Florida, either by the bag or bale (pine-straw).

1. This document is FOR 69, one of a series of the School of Forest Resources and Conservation Department, UF/IFAS Extension. Original publication date October 1999. Revised March 2014 and May 2017. Visit the EDIS website at <http://edis.ifas.ufl.edu>.

2. Mary L. Duryea, former associate dean for research & associate director, Florida Agricultural Experiment Station, and professor, School of Forest Resources and Conservation; and Patrick J. Minogue, associate professor of silviculture, UF/IFAS North Florida Research and Education Center; UF/IFAS Extension, Gainesville, 32611.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county's UF/IFAS Extension office.

U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.

To compare the settling of the six mulches we installed plastic rings with 9 cm (3.5 in) deep mulch in a plowed open field at the Austin Cary Memorial Forest near Gainesville. Every 3 months in the first year and again after 2 years, the depth of the mulches was measured.

Settling of the Mulch

All the mulches settled some in the first year with the pine-straw and the utility mulch settling the most (Figure 1). After two years the pine-straw was almost completely gone with an average depth of 1 cm. The utility and eucalyptus mulches were next with about 5 out of the 9 cm remaining. Pinebark and cypress had the same amount (6 cm) and melaleuca was still the deepest with almost 7 of the original 9 cm left.

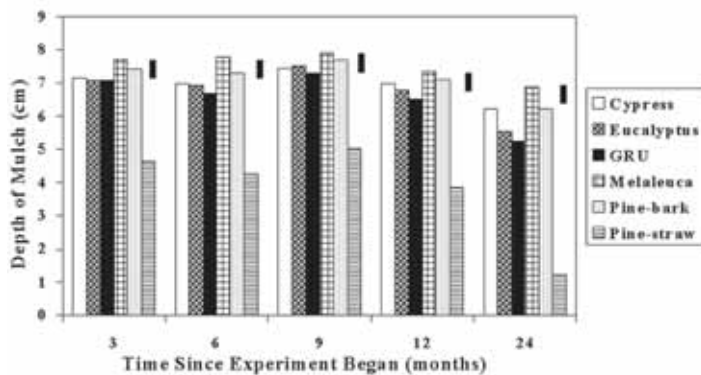


Figure 1. Settling of 6 landscape mulches (from original depth of 9 cm (3.5 in)) during the two year study.

Other studies have had similar results with mulch settling. In a study that compared 15 organic mulches, leaf mulches (grass, oak, and pine needles) had the greatest subsidence along with two-yard waste mulches (Stinson et al. 1990). In another study, cypress settled the least followed by eucalyptus, melaleuca, and pine-straw (Brown 1996). Mulches that have leaves will settle more than woody mulches.

Conclusions

As mulch settles or becomes thinner, its benefits are diminished. Weeds will be able to germinate and grow without impediment. Evaporation from the exposed soil will increase causing soils to dry out sooner. Exposure to rain and wind may increase erosion. For these reasons as mulch settles, it needs to be replenished or replaced.

In this study pine-straw mulch settled the most, decreasing to half its depth in 1 year and a negligible amount of mulch after 2 years (Table 1). Melaleuca was superior to the other mulches, although pine-bark and the cypress still had 6 of the 9 cm left—enough mulch to provide all of the benefits. This study showed that after applying mulch at a depth of 9

cm, four of the six mulches maintained a useful depth for 2 years.

Table 1. Ranking of mulches for settling after 1 and 2 years.

Settling	Mulch	
	After 1 year	After 2 years
Least	Melaleuca Pine-bark	Melaleuca
Least	Cypress Eucalyptus	Cypress Pine-bark
		Eucalyptus Utility
Most	Pine-straw	Pine-straw

References

- Brown, S. 1996. "Response of Hibiscus to organic mulches." *Proc. Fla. Hort. Soc.* 109:30–33.
- Duryea, M.L., R.J. English, and L.A. Hermansen. 1999. "A comparison of landscape mulches." *J. Arboric.* 25:88–97.
- Duryea, M.L., J.B. Huffman, R.J. English, and W. Osbrink. 1999. "Will subterranean termites consume landscape mulches?" *J. Arboric.* 25:143–150.
- Stinson, J.M., G.H. Brinen, D.B. McConnell, and R.J. Black. "Evaluation of landscape mulches." *Proc. Fla. Hort. Soc.* 103:372–377.