

Why Mulch Volcanoes are Bad



A dogwood tree with a wide, flat mulch ring that imitates mulching by Mother Nature. Photo by Chris Starbuck, University of Missouri

Mulching is one of the most important cultural practices to help new trees and shrubs get established and keep them healthy. Mulch conserves soil moisture, moderates soil temperature, reduces competition from roots of weeds and turf and generally facilitates penetration of water to the roots of woody plants. However, as with most cultural practices, too much of a good thing can have negative effects.

A common approach to mulching trees is to place the mulching material in a 2- to 3-foot-diameter circle and 8 to 12 inches deep. Some such mulch rings are made with a "bowl" in the center, but in many cases, the mulch is simply piled up around the trunk to form a "volcano." While a mulch volcano is generally better than no mulch at all, there are several volcano-induced problems that can have serious effects on plant health. First, when mulch is placed more than about 4 inches deep, roots tend to "migrate" up into the mulch during rainy periods or when the area is irrigated. This is partly due to (temporarily) favorable root growth conditions in the mulch and partly to suffocation of deep roots due to mulch-induced water logging of the underlying soil. Then, when drought conditions occur, the plant may come under severe stress because many of its roots are growing in a material with much less water holding capacity than real soil.



The "mulch volcano" on this newly transplanted tree is an excellent example of how not to mulch. Photo by Chris Starbuck, University of Missouri



This photo shows the "umbrella" effect that can occur with mulch. In this case, an automatic irrigation system was installed but the mulch had become hydrophobic on top due to fungal activity and was shedding water to the surrounding turf. Note the dry mulch where a shovel full has been removed. This situation can lead to drought stress if roots haven't grown beyond the mulch. Photo by Chris Starbuck, University of Missouri

Another problem sometimes associated with mulch volcanoes that can kill new trees is the "umbrella" effect. I observed an excellent example of this last summer in a commercial landscape. Several 3-inch caliper volcano-mulched sweetgum trees were planted in a turf area with an automatic irrigation system. While the turf looked terrific, the trees showed a steady decline. When I stopped to investigate, it was clear that the trees were dying from drought stress. The surfaces of the mulch volcanoes around each tree had become hydrophobic due to fungal activity and were acting as very effective umbrellas, shedding water to the surrounding turf. This is more common in high carbon mulches like sawdust, wood chips or ground wood, but it can also occur in bark mulches. It should be kept firmly in mind that, until a newly planted tree can grow roots out of the original soil ball and into the surrounding soil, the tree is absolutely dependent on moisture in the original ball. If the ball is kept dry by a mulch umbrella/volcano, the tree will suffer severe drought stress during the establishment period.

Other possible problems with mulch volcanoes are promotion of fungal canker diseases by constant moisture around the lower trunk, stress from poor gas exchange by the cells in the bark and damage from rodents that may make take up residence in the volcano.

When deciding on the best approach for mulching trees and shrubs in the landscape, go for a walk in the woods to see how Mother Nature does it. Trees in their native habitats rarely have individual mulch rings. Plants tend to share a large common soil volume that is nicely mulched

by decomposing leaves that are releasing minerals to the soil. Also, the mulch layer is rarely more than 2 inches thick and never in the form of a volcano.

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