



WRITING SAMPLE

Publication: eHow.com

Publish date: June 2013

Can Saltwater Kill Redwood Trees?

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Giants of the forest, redwood trees (*Sequoia sempervirens*) can soar to more than 300 feet tall, dwarfing the humans who admire the trees' lofty heights. A drive through Northern California's Avenue of the Giants often is punctuated by stops for photo opportunities of these conifer trees that are hardy in U.S. Department of Agriculture plant hardiness zones 7 to 9. The trees' proximity to the Pacific Ocean, however, may make their admirers wonder whether or not the redwoods are susceptible to damage or death from saltwater.

Habitat

Redwood trees do not grow very close to ocean water because they are sensitive to salt, as are many other trees and plants. Although the term "coastal redwoods" often is used to describe California's and Oregon's redwood trees, the trees' natural habitat is actually a few miles inland. Constant and immediate exposure to saltwater would be devastating to redwood trees.

Salt Exposure

Despite the fact that redwoods' habitat doesn't put them in immediate salt-related danger from ocean water, they nevertheless face salt-related damage or death, mostly from salt-contaminated soil. Salt applied to roadways to melt ice can leach into soil and be absorbed by the fast-growing redwoods. Salty runoff from streets, driveways and sidewalks miles away from redwoods eventually can make its way to the trees' habitat. Also, man-made irrigation systems for cultivated redwoods can deliver water with undesirable concentrations of salt. Drought conditions can further complicate soil conditions, resulting in higher salt concentrations. The trees also can be exposed to salt when they are splashed with salt-laced snow or water from de-iced roadways.

Salt Damage

Salt taken in by redwoods' roots dehydrates the trees' tissues and inhibits normal water absorption. The damage first appears as brown needle tips. The brown discoloration progresses toward the base of the needles as the salt exposure continues. The salt "can tie

up the shuttle system and restrict uptake of magnesium and potassium, two chemicals that are essential for making chlorophyll," George W. Hudler, professor of plant pathology at Cornell University, explained in an Extension bulletin of the New York State College of Agriculture and Life Sciences. New needles may die as chloride ions accumulate in them, he wrote. That situation can be lethal to the trees over time.

Prevention

One way to reduce the risk of salt contamination killing redwoods is to avoid applying large amounts of salt to roads and sidewalks. Instead, you could use smaller amounts or use a different method of snow and ice removal. Snow fences or other barriers in roadway splash zones can help to prevent direct contact between salt and redwoods. Instead of planting redwoods in an area that is likely to have a high salt concentration, plant different kinds of trees.