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Managing the Effects of Road Salts on Roadside Trees

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Introduction

ROAD SALTS AND DEICERS ARE important tools for maintaining safe roadways. In the Pacific Northwest, salt compounds used during winter reduce ice accumulation on roads, particularly in areas such as mountain passes, where snow and ice create hazardous driving conditions. In the summer, magnesium chloride and other products applied to gravel roads help to suppress dust and stabilize roads.

Although road salts serve an important public safety function, they also affect roadside trees and other vegetation. Plants like these located along roadsides provide important functions, including erosion control, wildlife habitat, visual screening, and, in forested areas, future timber. They also help to maintain public safety. Trees weakened by road salt, insects, disease, drought, or other stressors, however, may experience branch dieback or mortality, increasing the potential for falling limbs or trees near roadways.

Understanding road salts' effect on trees is thus crucial knowledge for landowners interested in making land management decisions that reduce long-term impacts on vegetation. This bulletin provides the basic information needed: the types of road salts available, how they affect trees, and the most effective practices to protect roadside trees.

What Is in Deicers?

Several types of products treat roadways, including sodium chloride (rock salt), magnesium chloride, calcium chloride, salt brines, and abrasive materials, such as sand or other aggregate. The type and amount of product applied varies depending on temperature, weather conditions, roadway characteristics, and application timing.



Figure 1. Prolonged exposure to road salts can severely impact tree health. The first symptoms of salt damage to road trees include browning needles, often in an irregular pattern (think slush or rain spray from the roadway).

Common Symptoms of Salt Injury

- Browning needles, beginning at the distal (tips) edge and moving inward toward the bole
- Browning or burnt patches on foliage
- Reduced annual growth and low overall vigor
- Branch dieback
- Delayed bud break
- Increased insect and disease problems
- Poor seedling survival

Sodium chloride (rock salt) is one of the most commonly used deicing products. Although effective at reducing ice accumulation, it also damages surrounding vegetation. Sodium and chloride accumulate in soil and plant tissues, affecting water relations, nutrient availability, and plant growth. Excess salts in a root zone make it more difficult for roots to extract water from the soil (Zamora Re et al. 2022).

Magnesium chloride is also commonly used for deicing and dust suppression. Although magnesium and chloride are essential nutrients at appropriate concentrations, excessive amounts can damage trees. Magnesium chloride applied to roads moves into adjacent soils through precipitation, where tree roots may take it up. Chloride accumulates in leaves and needles, resulting in foliar injury and, with prolonged

exposure, more extensive tree damage (Goodrich and Jacobi 2008).

The type of deicer matters, but application rate, weather, drainage, traffic, and proximity to a roadway also influence how much salt reaches nearby trees.

How Road Salts Affect Trees

Road salts affect trees through two primary pathways: direct exposure to foliage and soil accumulation. Salt spray occurs when traffic, wind, snowplows, or other roadway activities distribute deicing products. Salt deposited directly on foliage draws water from plant tissues, resulting in dehydration and tissue injury. Conifers can be particularly vulnerable because they retain their needles year-round, while deciduous trees may experience injury to buds and emerging foliage. Tree species vary considerably in their tolerance to salt exposure.



Figure 2. Spray patterns of snow and slush can have varying effects on each tree within a road right-of-way.

Salt may also enter a root zone through runoff and melting snow. As salts accumulate in the soil, they make water more difficult for roots to absorb. High salt concentrations also interfere with the uptake and balance of essential nutrients. Furthermore, excess sodium affects soil structure and water movement (Zamora Re et al. 2022). Over time, these effects reduce tree growth and vigor.

Salt injury may be acute, appearing during the same growing season, or chronic, developing over several growing seasons. Symptoms vary by tree species and exposure pathway, but common signs include browning or scorching of leaf margins and needle tips, premature foliage loss, reduced growth, branch dieback, and, in severe cases, tree mortality (Figures 1 and 2; Idaho Department of Lands 2022).

Salt damage also makes it more difficult for trees to withstand other stressors. As tree vigor declines, trees may become more susceptible to insects, diseases, drought, and other environmental stresses.

Complicating its identification is the fact that salt injury also resembles other forms of stress, like drought, winter injury, herbicide damage, insects, and disease. The location and pattern of damage, proximity to a treated roadway, drainage patterns, and the side of the tree that faces a road provide useful clues when attempting to diagnose potential salt injury (Figure 3; Idaho Department of Lands 2022).



Figure 3. Common symptoms of salt damage on foliage include browning needles, beginning at the distal (tips) edge and moving inward toward the bole.

How Can Landowners Reduce Roadside Tree Damage?

Landowners have little control over where snow falls or where snow berms are left after plowing. However, the following management practices can help to reduce salt exposure and improve the ability of roadside trees to withstand salt stress.

Move snow berms away from roadside trees when possible. Where landowners have control over snow removal, avoid placing snow directly around trees or within their root zones because snow removed from roads can contain concentrated salts.

Select salt-tolerant tree species for new plantings. Tree species vary considerably in their tolerance to salt exposure. When planting near roadways, select species with demonstrated tolerance to the type of salt exposure expected at the site. Contact your local Extension office or nursery to help identify species suitable for your region.

Improve soil drainage where appropriate. Compacted or poorly drained soils increase the effects of salt by limiting water movement and root growth. Practices such as reducing compaction or improving drainage may improve soil conditions. Additionally, soil testing can help determine whether amendments suit a particular site. Ultimately, adequate drainage is crucial because water in motion flushes salts from the root zone and beyond the affected soil (Zamora Re et al. 2022).

Use barriers or snow fences near vulnerable trees. Temporary barriers help reduce the amount of salt-laden snow and spray that reaches trees closest to the roadway, thus lessening the chance of direct exposure.

Rinse salt from foliage and soil when conditions allow. In spring, use fresh water to wash salt deposits from foliage and to flush soluble salts from the upper soil profile. Again, adequate drainage moves salts away from a root zone rather than simply redistributing them. Although the effectiveness of washing accumulated salt from needles is not well established, studies show that additional leaching helps move salts through the soil (Goodrich and Jacobi 2008).

Consider roadway tree density. For forest landowners, strategically managing tree density near roadways is helpful, particularly because it may provide a longer-term approach to reducing conflicts between trees and road maintenance. Remove selected trees and other vegetation (sometimes referred to as “daylighting”) to reduce shade on the roadway and thus potentially decrease snow and ice accumulation.

Reducing tree density also decreases competition for water, nutrients, and sunlight, potentially improving the vigor of remaining trees, which provides important erosion control, wildlife habitat, visual screening, and other benefits. However, always carefully plan out a reduction. Before removing any roadside trees, consider roadway safety, slope stability, drainage, property boundaries, and applicable regulations.

Note that salt damage is often greatest near treated roadways, but the area affected varies considerably. Wind, traffic, snowplowing, topography, drainage patterns, and application rates influence how far salt travels. On straight segments of nonpaved roads treated with magnesium chloride, most damage symptoms have been observed within approximately 20 feet of the road. However, splash and aerial spray along treated highways can extend much farther. Furthermore, drainage areas below roads can concentrate salts hundreds of feet from the roadway (Figure 3; Goodrich and Jacobi 2008).

Reforestation Considerations

Road salt affects not only established trees but also seedlings and other young trees by reducing water availability, interfering with nutrient uptake, and limiting root development (Zamora Re et al. 2022). These conditions create additional challenges for natural regeneration and newly planted seedlings attempting to establish near treated roadways.

Forest landowners planning reforestation or natural regeneration projects should consider potential salt exposure when selecting planting locations and species. Establishing seedlings farther from heavily treated roadways or selecting species known to tolerate roadside conditions may improve establishment success.

When possible, monitor seedling survival and growth during the first several years after establishment. Early identification of poor growth, foliage injury, or mortality helps landowners determine whether salt exposure or another site factor may be contributing to regeneration problems.

A Balancing Act

Although road salts play an important role in roadway safety and maintenance, they also have unintended effects on roadside trees and other vegetation. Understanding how they move through an environment, recognizing the symptoms of salt injury, and considering salt exposure when managing roadside trees help landowners reduce unnecessary losses. Indeed, thoughtful roadside management protects public safety while also supporting healthy trees, successful regeneration, and long-term timber productivity.

Further Reading

Gibson, M. J. R. 2026. "Minimize Deicer Damage with Salt Tolerant Plants." PennState Extension. https://extension.psu.edu/minimize-deicer-damage-with-salt-tolerant-plants.

Goodrich, B. A., and W. R. Jacobi. 2008. "Magnesium Chloride Toxicity in Trees." Fact Sheet 7.425. Colorado State University Extension. https://extension.colostate.edu/resource/magnesium-chloride-toxicity-in-trees/.

Idaho Department of Lands. 2022. "Herbicide and Road Salt Damage to Trees." Forest Pest Fact Sheet.

Zamora Re, M. I., A. Tomasek, B. G. Hopkins, D. M. Sullivan, and L. Brewer. 2022. "Managing Salt-Affected Soils for Crop Production" (PNW 601). Oregon State University Extension Service. https://extension.oregonstate.edu/catalog/pnw-601-managing-salt-affected-soils-crop-production.

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