



The Impact of Road Salt on Vegetation

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How does road salt affect vegetation?

- **Increasing water stress.** In the root zone, water molecules are held very tightly by salt ions, making it difficult for roots to absorb sufficient quantities of water. In sensitive species, this “physiological drought” may result in depressed growth and yield.
- **Affecting soil quality.** The sodium ion component in rock salt becomes attached to soil particles and displaces soil elements such as potassium and phosphorus. As a result, soil density and compaction increases and drainage and aeration are reduced. In addition, chloride and calcium can mobilize heavy metals in affected soils. Plant growth and vigor are poor under these conditions.
- **Affecting mineral nutrition.** When the concentration of both the sodium and chloride components of salt in the root zone is excessive, plants preferentially absorb these ions instead of nutrients such as potassium and phosphorus. When this occurs, plants may suffer from potassium and phosphorus deficiency.
- **Accumulating to toxic levels within plants.** The chloride component of salt is absorbed by roots and foliage and becomes concentrated in actively growing tissue. Plants repeatedly exposed to salt over long periods of time may accumulate chloride ions to toxic levels, resulting in leaf burn and twig die-back.

How do plants respond to excessive salt?

Unlike animals, plants do not have mechanisms to excrete excess salt from tissues and can only “shed” salt in dead leaves and needles. Because conifers do not shed leaves on a yearly basis, they tend to suffer damage from accumulated salt more easily than do deciduous trees. Plant species vary in their tolerance to salt exposure. Plants that are tolerant of salt grow as well in saline soils as they do under normal conditions. Many herbaceous plants such as grasses adapt fairly readily to

high salt levels. Among woody plants, tolerance varies with the species.

Plant species with waxy foliage or scaled, protected buds are generally more tolerant of salt spray. In salt-sensitive plants, exposure to salt can result in poor growth, stunted leaves, heavy seed loads, twig and branch die-back, leaf scorch, and premature leaf drop. Plants stressed by excessive salt are also more susceptible to biotic diseases and insect pests.

How can we minimize salt injury?

The best solution to the de-icing salt problem is to prevent contamination. On sidewalks and driveways, clear the snow first, and then use minimal de-icing product to treat the pavement. If vegetation is located in areas where salt spray occurs, erect barriers or screens to protect plants during the winter months. Antidesiccants may also help prevent injury when applied to evergreen foliage where de-icing salt will be used.

Once soil becomes contaminated with salt, the damage can be reduced by leaching the salt with fresh water as soon as possible after exposure. Under certain circumstances, incorporation of gypsum at the rate of 50 lb/1000 sq ft into the top six inches of soil at the drip-line of trees may also be helpful. Furthermore, foliage exposed to salt spray may be washed with salt-free water to remove deposited salt.

Salt-resistant evergreens

Trees

American Holly *Ilex opaca*
Eastern red cedar *Juniperus virginiana*
Southern magnolia *Magnolia grandiflora*
Colorado blue spruce *Picea pungens glauca*
White cedar *Thuja occidentalis*

Shrubs

Inkberry Holly *Ilex glabra*
Juniper *Juniperus species*
Wax myrtle *Morella cerifera*
Cherry laurel *Prunus laurocerasus*

Groundcovers

Daylily *Hemerocallis (avoid H. fulva)*
Lamb's ear *Stachys byzantina*
Creeping thyme *Thymus praecox*

When landscaping, place trees and shrubs that are salt-sensitive as far as possible from problem areas. Select planting sites that are not subject to salt-contaminated waters, and place shallow diversion ditches between roadways and plantings. When vegetation must be placed near roadways, utilize salt-tolerant plants. Keep in mind that stress due to de-icing compounds may predispose plants to diseases and insects and may enhance their sensitivity to other environmental stresses.

This article was excerpted from a Plant & Pest Advisory published by the Rutgers Cooperative Extension.

<http://plant-pest-advisory.rutgers.edu/?p=2393>

<http://ocean.njaes.rutgers.edu/documents/SaltTolerantPlantslist-Final.pdf>