

## Winter's assault of rock salt

By **Bruce Wenning**/ Special To The Tab  
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**D**uring the winter our environment is inundated with road salt. Millions of tons of de-icing salt, commonly called rock salt (sodium chloride) is applied to roads, parking lots, sidewalks, driveways, and stairs to melt ice or prevent ice formation. This is done to reduce the hazard of pedestrian slips and falls and vehicle accidents. However, it is not effective below 20 °F.

However, rock salt applied for our safety has several non-target pathways in the environment: (1) it seeps into pavement surfaces and creates a reservoir of salt for later transport for contamination, (2) it is splashed to roadside soil and vegetation by vehicles where it is concentrated in plowed and shoveled snow piles (3) it is washed away by surface runoff into soil, ground water, rivers, lakes, ponds, and streams (4) it leaches through soil into the plant root zone (5) it becomes air-borne into our atmosphere and settles on vegetation (6) it gets onto vehicles and roadway structures contributing to corrosion.

Rock salt is toxic to many perennial plant species of trees, shrubs, grasses and herbs. Salt-contaminated snow and ice eventually melt and leach into soil, killing soil microbes, which contributes to soil compaction.

Rock salt in soil breaks down into ions of sodium and chloride. The chloride ions are the more damaging; when taken up by plant roots in spring and summer they are transported to growing points such as buds and branch tips, killing them. Leaves show symptoms of salt damage by exhibiting brown colored leaf margins. This is where chloride ions were deposited and concentrated in the leaf tissue, creating localized cell death that resembles drought stress. Eventually entire leaves can "brown out" and die. Twigs and small branches can soon follow suit.

Vehicular traffic on salted roads releases pavement salt, making it airborne. Rock salt molecules travel in wind currents created by traffic flow and settle on roadside vegetation. This action, called salt spray, can cover trees as high as forty feet and an area as deep as 150 feet from the road, although the most noticeable plant damage is within thirty feet of the road. Contaminated soil and salt spray are the two most common ways plants get injured from road salt.

Repeated exposure to rock salt by salt sensitive deciduous trees will cause bud death and branch dieback, forcing dormant buds below the affected area to grow out in response. This recovery growth response of multiple stems with leaves is called "witches brooms" and it is diagnostic of salt exposure. It is easily observed on cherry and maple trees along heavily salted roadsides. Another sign of rock salt toxicity is summer and early fall defoliation.

Evergreen trees such as hemlocks and pines show brown-tipped needles well into summer. With annual exposure to salt spray from traffic or soil

contamination, the needles turn completely brown, die and fall off. Evergreens and salt-sensitive deciduous plants are weakened by repeated exposure to rock salt, increasing their susceptibility to insects, diseases and fertility problems; this can lead to their premature death.

There are protective measures you can take to lessen the effects of rock salt damage to plants. First, switch to sand or use ice melting products that are safer for plants, pets, and the environment, such as potassium chloride or “pet safe” calcium chloride products, which are effective de-icing compounds to -15 °F and below. Although these products are a little more expensive than rock salt, they significantly reduce plant damage and environmental contamination. Second, plant salt-tolerant plants. Third, protect salt sensitive plants with burlap wraps, wooden coverings facing the road and by flushing the root zone in spring and summer with lots of water, although root zone washing is only effective with well-drained soil.

*Pirone's Tree Maintenance* (7th ed.), *Hartman, Pirone and Sall*. ranks trees from “Very tolerant” (least sensitive) to “Intolerant” (most sensitive), as follows: Very tolerant: White oak, red oak, black cherry, and eastern red cedar. Tolerant: Yellow birch, black birch, paper birch, gray birch, black locust, and largetooth aspen. Moderately tolerant: Norway maple, red maple, shagbark hickory, hop-hornbeam, American elm, and linden. Intolerant: Sugar maple, white pine, hemlock, beech, red pine, and speckled alder.

For more information, see: [www.UMassGreenInfo.org](http://www.UMassGreenInfo.org), [www.extension.umn.edu](http://www.extension.umn.edu), [www.safnet.org](http://www.safnet.org).

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