Preventing Salt Injury to Trees and Shrubs

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Every winter brings its requisite a-salt on roads and walkways. While a measure of it may be necessary for public safety in icy conditions, too much salt is worse than a lousy pun. It's evident that cars and concrete suffer from deicing materials, and we've heard how saline runoff from roads can enter waterways and hurt fish and other aquatic life.

But salt harms woody plants in ways that go far beyond burned evergreen needles. This damage to trees and shrubs can be subtle, and is sometimes attributed to other causes. It's obvious that when road-salt spray lands on evergreen foliage, it results in chlorotic and browned needles the following spring. Entire branches, as well as smaller trees, may be killed as a result of heavy and repeated exposure.

Deciduous trees respond differently. Salt-spray deposition causes twig dieback and bud mortality. Stunting and deformed growth are also possible. Because hardwood trees have to produce adventitious buds each spring due to their primary vegetative buds getting salted to death in winter, growth patterns begin to resemble witches' brooms. Of course it stands to reason that their energy budget suffers, making them more vulnerable to pests and pathogens.

Less apparent, but worse in my opinion, is the insidious harm caused when salt infiltrates a tree's root zone. In urban areas, salt-laden snow is routinely plowed onto tree lawns, tree pits, and landscape islands. Concentrated brine may run off onto low-lying sites. Abundant salt in the soil will kill a tree. But moderate levels of salt make water unavailable to tree roots, producing a physiological drought, even in moist soils.

This latter injury may show up as brown, scorched-looking leaf margins in July, when deicing salt is the last thing on people's minds. It can also manifest as subtle, cumulative damage that weakens a tree year after year until eventually it succumbs to other adverse conditions, or opportunistic agents.

Salt actually damages soil structure, causing what's known as sodium compaction. In healthy soils, microbes help form aggregates or clumps which result in natural channels that allow roots to get oxygen. Sodium chloride, road salt, breaks the chemical bonds holding these clumps together, and the pore spaces collapse. This restricts roots' access to air, further stressing trees. High sodium levels also reduce a tree's ability to take up potassium, a key nutrient.

While it was once thought that rain could wash most or all road salt from soils over the course of a growing season, it now appears that this is generally not the case. In soils exposed to deicing salt, salinity builds slowly over time.

You can estimate the level of salt at a given site using an electrical conductivity meter, which measures something called total dissolved solids (TDS). Meters are available in the $50 to $100 range. Naturally occurring minerals and fertilizer will add to the TDS reading, so it is not an exact reflection of deicing salt. Place a small amount (100-120g or

4 oz.) of soil in a container and add water until it's just past saturation, then take a reading of the slurry. Values greater than 2000 ppm (or millimhos/ square centimetre, depending on the instrument) spell trouble for plant life. To encourage the movement of salts through the soil profile, an arborist can use high-pressure air or water injection treatments to help break up compacted soil and provide drainage channels.

There are many low-salt recipes for addressing this problem. Homeowners can reduce salt damage by using only sand or other mineral abrasives, or by at least switching to a salt/sand mixture. Alternative deicing products like calcium magnesium acetate (CMA) are much less toxic to plants, though they cost more. Where practical, Tyvek (preferred) or burlap barriers around evergreens can deflect road-salt spray. Berms and other grade changes can divert snow-melt runoff from root zones.

Another option is to plant salt-tolerant tree species such as honeylocust, ginkgo, catalpa or red oak in place of sensitive species like sugar maple, linden, and spruce. You can get a complete list of salt-tolerant trees at
http://www.hort.cornell.edu/uhi/outreach/recurbtree/pdfs/~recurbtrees.pdf

More information on ways to reduce the winter "a-salt" on trees and shrubs can be found on the Muskoka Watershed Council's website at
https://www.muskokawatershed.org/blog/salt-damage/

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