Photo 1. The turf directly adjacent to the drive has been killed by deicing salt. Reseeding or sod replacement will be necessary.

Photo 2. These red pines along a road have been severely desiccated from wind and salt spray. In many cases, these trees will resume growth the following season but may be stunted, discolored and stressed.

Photo 3. Deicing salt applied the previous winter may affect plants the following spring. These maple leaves show scorch symptoms typical of high soil salts.

Photo 4. This landscape is irrigated with water from the lake in the background. The water tested at a pH of over 8.0 and contained a very high level of salts even into the summer. Daily irrigation is causing decline in many of the landscape plants and trees (inset: Oak).

Photo 5. Where injury from deicing salt is suspected, a solubridge may provide the necessary confirmation by testing the water or soil.

The Plant Doctor's LANDSCAPE TIPS

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DEICING SALT AND PLANT INJURY

INTRODUCTION:

With winter weather that brings snow and freezing rain, 'tis the season for deicing salt. Deicing salt, mostly sodium chloride, performs some wonderful chemistry by melting frozen water, enabling motorists and pedestrians to usually proceed to their destination without any serious mishaps. However, there is a problem with deicing salt; plants and deicing salt don't mix well. Plants vary greatly in their susceptibility to salt; however, all plants are susceptible to salt injury if concentrations are sufficiently high.

SYMPTOMS:

Deicing salt may cause a variety of symptoms on plants. There are acute symptoms, which are best described as those symptoms that manifest themselves immediately and obviously or outwardly. These symptoms are readily witnessed during the winter and very early spring. Turf is readily affected by deicing salt (Photo 1) but may not be evident until early spring when unaffected turf easily demarcates affected areas. Symptoms on evergreens are often quite apparent during the winter months. Among the conifers, native white pine and arbor vitae are highly susceptible to salt spray from nearby roads (Photos 2). Austrian pine is generally much more tolerant of salt, the reason this species has been widely planted along highways. While Austrian and perhaps Scotts pine may appear to be our salvation from salt woes, let's not forget that these introduced species are highly susceptible to a multitude of insects and disease problems.

Plants may also exhibit latent symptoms from deicing salt. Latent symptoms typically show up weeks or months after the application of salt. Deicing salt may concentrate in the soil or in water (streams, lakes and rivers) during the winter and subsequently affect plants during the growing season. In soil, high concentrations of salts may kill roots outright or impede the uptake of water by the roots. In science, when water uptake by roots is slowed or prevented, it is commonly called an osmotic imbalance, caused by a difference in soluble ions or salt on the interior of the root versus the outside of the root. Where roots have difficulty taking up moisture, we often see scorch symptoms in the foliage (Photo 3) and less growth during the season. The accumulation of deicing salt in streams and especially in "stagnant" lakes where there is little replenishing can cause decline or even death of many landscape plants, including trees (Photo 4), if this water is used for irrigation. Fertilizers may also contribute to salinity in water.

MANAGEMENT:

Soluble salts tests, performed by a soil testing lab or on site with the aid of a solubridge (Photo 5) may help diagnose salt injury. Obviously, the best management of salt injury to plants can best be achieved by not using deicing salt. For our industry, this is often not a practical tool since liability is a major factor. Sodium chloride is perhaps the most toxic and most common deicing salt partly because it is the most economical. Other salts, such as potassium chloride, are not nearly as toxic but may cost significantly more to purchase and apply. In areas where high quality landscapes or where salt has been an issue, an alternative salt such as KCL may make sense. Where practical, adding sand or other media to stretch the efficacy of salt may prove beneficial. Protective barriers, such as burlap, have been utilized successfully for low lying groundcovers or shrubs. Anti-desiccants may also help protect foliage and buds from salt injury. Water with a high salinity should not be used for irrigation. In many landscapes, nature normally performs an invaluable service by flushing salt from soil during the spring rains. Where excessive salt has accumulated in soils from nearby applications, flushing the soil with "clean" water to leach salt from the root zone may help.

For more information, please feel free to email me at robertsd@msu.edu or contact a professional plant health-care provider. The author, MSU or MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.

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