

Across the Midwest, the use of deicing salts (primarily sodium chloride) in winter to maintain safe roadways, sidewalks, and driveways is a common practice. Despite the benefits, deicing salt deposited on trees and shrubs can cause extensive damage. Deicing salt is dispersed from roads by plowing, meltwater runoff, splash, and aerial spray. Plants sensitive to salts may show injury early and can decline quickly after exposure. When air-borne deicing salt is deposited directly onto twigs, buds, or needles, salt draws moisture out of plant tissue, causing desiccation and burn. On evergreens, such as pines and firs, salt spray causes dieback starting at the tips of needles. On deciduous plants, the symptoms of salt damage become more evident during summer or during hot dry weather, when leaf margins show burn or scorch. Salt spray and excess soil salts can also cause branch dieback, stunted growth of stems and foliage, overall lack of vigor, and death. Turf grass along sidewalks and streets can be completely killed due to excess soil salt.

Symptoms & Effects of Salt Injury

Air-borne Salt

- Plant damage caused by deposition of aerial salts is more widespread than that done by soil salts in the Midwest
- Injury caused by salt spray generally occurs on plants growing near highways and busy streets, where fast moving traffic causes salt dispersal onto nearby landscape plants
- Damage is most severe within 60 feet of the road and decreases with distance, but sensitive plants can show burn at distances of 1,000 feet or more from roadways
- On deciduous plants, salt spray can kill buds and twigs; new growth in spring appears as a cluster of twigs known as “witches’ broom”
- On evergreens, salt spray causes browning or yellowing of needles and twig dieback, often on the roadside portion of the plant only; sensitive evergreens planted within 300 feet of roadways can sustain severe damage
- Branches protected by snow or other barriers are less likely to be injured

Soil Salt

- Plant injury due to soil salt can occur when salt-laden meltwater runs off or splashes onto the soil, and when salt is plowed and shoveled directly on the root zone of nearby plants
- Excessive soil salt accumulates in drainageways, depressions, or areas immediately adjacent to roadways where salt-laden runoff is channeled or splashed
- Concentrated quantities of sodium and chloride can damage plants by direct absorption into the roots, causing toxic effects or root dehydration
- Injury caused by excessive uptake of soil salt includes browning along leaf edges, stunted growth, or fewer and smaller leaves, flowers, and fruit
- Plants grown in poorly drained soils and those that are marginally hardy are more severely injured

Minimize the Injury of Salt Damage

- Avoid or minimize the use of salt around landscape plants
- Reduce the amount of salt used by mixing sand, sawdust, or cinders with salt before applying

- Wait to apply a deicer until after shoveling and plowing, and avoid shoveling salt-laden snow over the root zones of salt sensitive plants
- Alter drainage patterns to avoid accumulation of salt runoff near plants
- Protect low-growing plants susceptible to aerial salt damage by constructing temporary, physical barriers made of burlap or fencing
- Use salt-tolerant plants in highly exposed areas
- Keep plants healthy by mulching to reduce water loss, and by irrigating to help move salts through the soil

Literature cited:

The inconsistency among various authorities in rating salt-tolerance of landscape plants makes it difficult for any one table to be thoroughly accurate. This compilation of salt tolerant plants was derived from the following sources:

Davidson, H. 1996. Tree and Shrub Tolerance to De-icing Salt Spray. *Michigan State University Extension Service Publication*, HM-95

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Recommended Salt-Tolerant Landscape Plants

T = Plants with highest degree of salt tolerance. Use in the most exposed areas.

M = Plants with a moderate degree of salt tolerance. Use in low salt areas.

***** = Plants tolerant of soil salt

Deciduous Trees			
Scientific Name	Common Name	Zone	Aerial Salt Tolerance
<i>Acer campestre</i>	Hedge maple	5-8	M
<i>Acer ginnala</i>	Amur maple	2-8	M
<i>Acer nigrum</i>	Black maple	4-9	M
<i>Acer pseudoplatanus</i>	Sycamore maple	5-7	T
<i>Acer saccharinum</i>	Silver maple	3-9	M
<i>Aesculus hippocastanum</i> *	Horse-chestnut	4-7	T
<i>Aesculus octandra</i>	Yellow buckeye	4-8	M
<i>Amelanchier x grandiflora</i>	Apple serviceberry	4-9	T
<i>Betula nigra</i>	River birch	3-7	M
<i>Carya cordiformis</i> *	Bitternut hickory	4-9	T
<i>Carya ovata</i>	Shagbark hickory	4-8	T
<i>Catalpa speciosa</i> *	Northern catalpa	4-8	T
<i>Celtis occidentalis</i> *	Hackberry	2-9	M
<i>Diospyros virginiana</i>	Persimmon	4-9	M
<i>Ginkgo biloba</i> *	Ginkgo	3-8	M
<i>Gleditsia triacanthos</i> *	Honey locust	3-9	T
<i>Gymnocladus dioicus</i> *	Kentucky coffeetree	3-8	T
<i>Juglans cinerea</i>	Butternut	3-7	T
<i>Juglans nigra</i> *	Black walnut	4-9	T
<i>Koelreuteria paniculata</i>	Golden rain tree	5-8	M
<i>Larix decidua</i>	European larch	2-6	T
<i>Larix laricina</i>	American larch	2-5	T
<i>Liquidambar styraciflua</i> *	Sweet gum	5-9	T
<i>Magnolia x soulangiana</i>	Saucer magnolia	5-9	M
<i>Malus</i> (some cultivars)	Crabapple	5-7	M
(x <i>zumi</i> 'Calocarpa', 'Adams', 'Donald Wyman', 'Prairifire')			
<i>Nyssa sylvatica</i> *	Tupelo	4-9	M
<i>Ostrya virginiana</i>	Ironwood	3-9	M
<i>Platanus occidentalis</i> *	Sycamore	4-9	M
<i>Prunus maackii</i>	Amur chokecherry	3-6	M
<i>Prunus virginiana</i> *	Choke cherry	2-6	M
<i>Pyrus calleryana</i>	Callery pear	5-8	M
<i>Quercus alba</i>	White oak	3-9	T
<i>Quercus bicolor</i> *	Swamp white oak	4-8	M
<i>Quercus ellipsoidalis</i> *	Northern pin oak	4-6	M
<i>Quercus imbricaria</i>	Shingle oak	4-8	M
<i>Quercus macrocarpa</i> *	Bur oak	2-8	M
<i>Quercus robur</i>	English oak	4-8	T
<i>Sassafras albidum</i>	Sassafras	4-9	M
<i>Syringa amurensis</i> *	Japanese tree lilac	3-7	T
<i>Syringa pekinensis</i> *	Peking lilac	4-7	T
<i>Taxodium distichum</i> *	Bald-cypress	4-9	T
<i>Ulmus</i> 'Regal'*	Regal elm	4-6	T

Evergreen Trees			
Scientific Name	Common Name	Zone	Aerial Salt Tolerance
<i>Juniperus chinensis</i> *	Chinese juniper	2-8	T
<i>Juniperus horizontalis</i> *	Creeping juniper	4-9	T
<i>Juniperus virginiana</i>	Eastern red-cedar	3-9	T
<i>Picea pungens</i> *	Blue spruce	2-7	T
<i>Pinus mugo</i> *	Mugo pine	2-7	T
<i>Thuja occidentalis</i> *	Eastern arborvitae	2-8	M

Shrubs			
Scientific Name	Common Name	Zone	Aerial Soil Tolerant
<i>Alnus rugosa</i>	Speckled alder	3-6	M
<i>Amelanchier canadensis</i>	Serviceberry	3-7	T
<i>Amorpha fruticosa</i> *	Indigo-bush	4-9	T
<i>Aronia arbutifolia</i>	Red chokeberry	4-8	M
<i>Aronia melanocarpa</i>	Black chokeberry	3-8	M
<i>Berberis thunbergii</i>	Japanese barberry	4-8	T
<i>Buxus microphylla</i>			
var. <i>koreana</i>	Korean boxwood	4-9	M
<i>Caragana arborescens</i> *	Siberian pea-shrub	2-7	T
<i>Caragana fruticosa</i>	Russian pea-shrub	2-6	T
<i>Clethra alnifolia</i>	Summersweet clethra	3-8	T
<i>Comptonia peregrina</i>	Sweet-fern	2-5	T
<i>Cotoneaster</i> species*	Cotoneaster	4-8	T
<i>Forsythia</i> spp.*	Forsythia	6-8	T
<i>Hamamelis virginiana</i>	Witch-hazel	3-8	T
<i>Hibiscus syriacus</i>	Rose-of-Sharon	5-8	M
<i>Hippophae rhamnoides</i> *	Sea-buckthorn	3-7	T
<i>Hydrangea</i> spp.	Hydrangea	3-9	T
<i>Hypericum</i> spp.	St. John's wort	3-8	T
<i>Ilex verticillata</i>	Winterberry	3-9	M
<i>Lespedeza bicolor</i>	Shrub bush-clover	4-8	T
<i>Myrica pensylvanica</i> *	Bayberry	3-6	M
<i>Perovskia atriplicifolia</i>	Russian-sage	5-8	T
<i>Philadelphus coronarius</i>	Mock-orange	5-8	M
<i>Potentilla fruticosa</i>	Shrubby cinquefoil	2-7	T
<i>Prunus x cistena</i>	Purpleleaf sand cherry	2-8	M
<i>Pyracantha coccinea</i>	Firethorn	6-9	T
<i>Rhodotypos scandens</i>	Black jetbead	4-8	T
<i>Rhus aromatica</i>	*Fragrant sumac	3-9	T
<i>Rhus glabra</i> *	Smooth sumac	3-9	T
<i>Rhus typhina</i> *	Staghorn sumac	4-8	T
<i>Ribes alpinum</i> *	Alpine currant	2-7	M
<i>Robinia hispida</i> *	Bristly locust	5-8	T
<i>Rosa rugosa</i> *	Rugosa rose	2-7	T
<i>Sambucus canadensis</i>	Elderberry	3-9	T
<i>Shepherdia canadensis</i>	Buffaloberry	2-6	M
<i>Spiraea</i> spp. (most)	Spirea	3-8	T
<i>Symphoricarpos albus</i>	Snowberry	3-7	T
<i>Syringa meyeri</i> 'Palibin'*	Palibin lilac	3-7	M
<i>Syringa patula</i> 'Miss Kim'*	Miss Kim lilac	3-7	T
<i>Viburnum dentatum</i>	Arrowwood viburnum	5-9	M
<i>Viburnum lentago</i>	Nannyberry	2-8	M
<i>Viburnum prunifolium</i> *	Blackhaw viburnum	3-9	M
<i>Viburnum trilobum</i>	American cranberry-bush	2-7	M