# Winter Snow De-icers and the Environment

## What is de-icer?

According to Dr. Ann Brooks Gould of Rutger's University, De-icing salts **make roadways and sidewalks safer by melting snow and ice**. De-icing salts **melt ice and lower the temperature at which new ice forms**.

De-icing salts are **commonly mixed with abrasives** to improve traction. These abrasives include sand, cinders, gravel, or sawdust.

## Can de-icers harm the environment?

**Salt** from roadways de-icing practices harms vegetation and the environment in three ways:

1. **Salt** increases moisture in the roots and on foliage. Foliage in direct contact with road salt sprayed by tires and wind becomes desiccated and may appear "burned".
2. **Excessive salt** in the soil changes soil structure. In addition, it reduces water permeability, drainage, and aeration.
3. The **nutrient balance** between the plant and its environment is upset. An excessive concentration of sodium ions in the root zone can cause plants to absorb sodium over other ions such as potassium and phosphorus. When this occurs, the plant may suffer from nutrient deficiencies.

## What about my pet?

- Thoroughly wipe off your pet's legs and stomach when he/she comes in out of the sleet, snow, or ice.
- Salt, antifreeze or other chemicals could hurt your pet if ingested while licking his/her paws. © 2004 ASPCA

**For more information, visit these WEBSITES**:

http://www.anjec.org - Assoc. of Environmental Commissions

http://www.epa.gov/region2 - NJ Environmental Protection Agency

http://www.aspca.org - ASPCA

http://www.njspca.org - NJ Society for Prevention of Cruelty to Animals

*This flyer prepared by the Alpine Environmental Commission*
http://www.alpinenj07620.org/ec

## How should I use de-icer?

- **Avoid** the application of deicers near all surface water, ground water drinking sources, and environmentally sensitive areas.
- **Do not use** fertilizer to melt ice and snow because the nitrogen and phosphorus in fertilizer can harm local streams.
- **Use** sand, ashes, or kitty litter to improve traction on icy sidewalks or steps.

According to the University of Maryland Cooperative Extension Service, **careless use of deicing products can damage both the home and the environment**:

- **Overuse of some de-icers can accelerate the freeze-and-thaw cycles that damage concrete,** taking years off the life of a sidewalk or driveway.
- **Some de-icers corrode metal**, causing damage to cars and aluminum siding.
- Chemicals in **many de-icers can damage plants and shrubs** near where the deicer is used if it is applied in large quantities.

**To prevent damage** to your home and the environment, choose an ice-melting product carefully. See the table below for information about the effectiveness and safety of deicers currently available.

## Liquid De-icer:

- **Not efficient for melting snow**
- Used as a **pre-treatment** in addition to other deicers
- Can be used with salt and sand but **does not** replace them
- **Must be applied before frost, snow, or ice** are on the ground
- Calcium chloride is available in liquid form
- **Salt brine** is a sodium chloride solution
- **Contain anti-corrosion agents**
- More commonly used on highways
- **Environmental impact** depends upon amounts used
- **Deterioration** can occur with continued use

## De-icer Product Table

| Product | Min Work Temp (F) | Speed | Damages Concrete & Metal | Safe for Plants? |
|---|---|---|---|---|
| Magnesium chloride | -13F | very fast | no | moderate |
| Calcium chloride | 5F | fast | yes* | no |
| Sodium chloride (salt) | 18F | moderate | yes* | no |
| Potassium chloride | 25F | slow | ok on old concrete | moderate |
| Calcium magnesium acetate (cma) | 25F | slow | no | yes |

*Sodium and calcium chloride are particularly damaging to newly poured concrete. Also, these chemicals should not be applied to brick or stone surfaces.

## Can de-icers harm my plants and trees?

**Small leaves, heavy seed loads, twig and branch die-back, early defoliation** and the **browning of leaf edges** similar to drought stress are **symptoms of salt injury**. **Plants** are also **more susceptible to disease** if they become stressed due to excess 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.

**Plants differ in their response to salt stress**. Some species are much more tolerant of salt than others. Salt tolerant plants can survive in saline soils and have growth and yields comparable to those plants of the same species growing under normal conditions. Many herbaceous plants adapt fairly easily to high salt levels, but woody species are not so fortunate.

## Salt Tolerance of Common Landscape Plants

**TOLERANT | SENSITIVE**

### SHRUBS

Bayberry
Boxwood
California Privet
Japanese Barberry
Pfitzer Juniper
Multiflora Rose
Honeysuckle
Vibernium
Van Houtle Spirea

### DECIDUOUS TREES

Black Cherry
American Elm
Black Locust
American Linden
Box Elder
Flowering Dogwood
Burr Oak
Ironwood
English Oak
Little-lead Linden
Green Ash
Red Maple
Honey Locust
Shagbark Hickory
Red Oak
Silver Maple
Russian Olive
Sugar Maple
Weeping Willow
Sycamore
White Oak
White Poplar

### EVERGREENS

Austrian Pine
Balsam Fir
Colorado Blue Spruce
Canadian Hemlock
Japanese Black Pine
Douglas Fir
Pitch Pine
Eastern White Pine
Red Cedar
Red Pine
White Spruce
Yew