

Preparing Trees and Shrubs For Winter

Harsh winter climates in Alberta can create many damages to trees and shrubs. Some of the most common damages occur due to cold temperature and dry air, winter sun, wildlife damage, salt, deep freeze, heavy snow and ice. There are a few things you can do to reduce potential damages.

Cold winter damage and prevention

Cold winter damages can happen due to tree inability to survive cold weather, lack of snow in some part of Alberta, strong cold and dry wind; heavy snow and ice in late fall or early spring. There are few things you are able to do to avoid cold winter damage.

- Choose hardy trees and shrubs that can withstand cold temperature. Alberta belongs to Canada Cold hardiness zones 1, 2 and 3 and partly zone 4. So choosing trees and shrubs that are hardy enough for our climate is the first step to protect them from cold winter
- Snow is an excellent insulator for trees and shrubs
- Planting trees and shrubs in protected area (buildings or already established tree shelter) to avoid direct exposure to strong wind
- Proper pruning will reduce the number of branch breaks during heavy snow or ice.

Root injuries and protection

Root injuries due to cold are one of the most impactful damages that trees and shrubs can sustain. Roots do not become dormant at the same time as branches, buds or trunk/stems. Several studies are showing that roots remain mostly inactive. Roots can and do function and grow during winter months whenever soil temperatures are favorable, even if the air aboveground is brutally cold. The freezing, heaving and cracking of winter soils physically damages roots - particularly the fine feeder roots in the uppermost organic layers. The root damages can also trigger a range of effects such as reducing a tree's ability to take up water and nutrients, particularly during a spring bud break, and to support stem and branch growth in summer. Severe root damages from winter will greatly contribute to whole tree mortality or part of the trees.

To protect roots is the most important thing that you can do for trees and shrubs. Here are several recommendations:

- Provide deep **watering** just before freeze (young or old trees). Frozen water is an excellent insulator and will reduce frost penetration to the root zone. Moist soil holds more energy than dry soil. Once the soil is dry, it is easier for the frost to penetrate deep and dry out roots. The freeze will take moisture from roots and create crystal icicles in the roots which will create physical damages to the root system. The best way to water is slowly with a soaker hose with approximately at the rate of 10 gallons (around 40 liters) per inch of tree diameter (tree diameter is measured at breast height).
- Good deep early snowfall will keep soil from freezing even if the air temperature is brutally cold

- If snowfall happened after soil is already frozen, deep snow will protect roots from January or March-early thaws when the temperature fluctuates
- **Mulching** is the most important root protection that you can do. Mulching provides a few key functions: prevents weeds, protects roots from extreme heat and keeps moisture around trees. Create a donut-shaped wood chip cover around your tree to keep water inside. Applying 2-4 inches (5-10 cm) of wood mulch will greatly reduce soil freeze. A layer of 3-4 inch of woodchips mulch will prevent heaving by maintaining more constant soil temperatures.
- For **newly planted trees**; check if there is a crack in the soil due to planting or dry fall. Filling up these cracks with soil to prevent cold air from entering the soil. Mulching would also prevent this as well.
- If you have a sandy soil you may **fertilize** in the spring or the fall on heavy clay soil after the leaves have dropped
- **Leave leaves.** Instead of disposing of autumn leaves, keep leaves on the ground, mulch or blend them into the soil to retain nutrients. Be very aware if you have some leaves disease (e.g. Leaf spots, bronze leaf disease, etc) you have to rake leaves to avoid future problems with diseases.



Picture 1. Mulching is the most important activity that you can do to prevent root damages from winter freezing and reduce the possibility of root damage and tree mortality. Mulching provides a few key functions: prevents weeds, protects roots from extreme heat and keeps moisture around trees.

Wildlife damages and prevention

As winter is very harsh for many wildlife species, they are looking for food usually on young and recently planted trees. Several wildlife species will create damages to your young trees. Mice, voles, rabbits, deer and moose will griddle and eat the bark, twigs, branches and buds by feeding on them. They can create severe damages- total or partial destruction of trees and shrubs. There are a few things you can do such as erecting physical barriers to prevent damages.

- Use mesh wire (1/4 inch in size) to protect trunk bark from mice, rabbits, voles and to some extent deer and moose. Deer and moose will strip bark either by eating or using their antlers
- Use plastic tree guards for small animals
- Properly install mesh wires of plastic tree guards with no gaps between the bottom of the mesh cylinder and the ground where animals could crawl under the fencing
- Build a large fence for deer or moose. Use some repellent as well



Picture 2. Meshed wire and plastic guards around the trunk

Salt damages and prevention

Various salt (chlorides) are used to prevent ice from forming on the road in Alberta. Among them, sodium chloride is one of the most damaging agents on trees and shrubs as some studies show. There are several things you may be able to do:

- Avoid or reduce the amount of salt used for de-icing
- Plant salt-tolerant trees and shrubs in the area with high use of salt
- Use other alternative de-icing material such as sand or small gravel
- You may put some trees under burlap to prevent salty spraying particles on the trees
- Move trees and shrubs further away to avoid salt damages



Picture 3. Small burlap to protect trees from salt around the driveway. Street trees are buried in snowpack with heavy salt in it.

Pruning

After leaves drop (Sept and Oct) you may be considering prune dead, diseased and damaged (3D) branches. Any infested branches dispose or burn. Perform proper 3-way cut pruning techniques and do not damage the branch collar during this process. Otherwise, avoid pruning this time of year as this may create additional stress to the tree.



Picture 4. A broken branch that needs to be removed and proper pruning allows the tree to heal a wound

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