

WINTER INJURIES TO TREES AND SHRUBS

A number of factors can contribute to the frequency and severity of winter damage to trees and shrubs. The plant species or cultivar, the location of the plant, the conditions under which it is grown, the timing of the weather extremes, and plant dormancy period are the primary reasons. Contrary to popular belief, prolonged or extreme cold temperatures is not the main cause of plant damage. Low temperatures in combination with extreme temperature fluctuation is more often the cause of injury.

Causes of Cold Damage

Lack of hardiness: Some plants are not completely hardy to an area. Use plant hardiness zone maps to help in selecting plants for particular locations.

Early or late season frosts: Early frosts in the fall can cause damage on plants that are normally adapted to an area. Plants need adequate time to harden off (adjust to outdoor conditions) before freezing temperatures occur. New growth that has been stimulated by late summer pruning or fertilization is very susceptible. It is never a good idea to apply plant fertilizers in the fall or early spring.

Plants can also be damaged when unseasonably warm temperatures during winter or early spring stimulates new growth. Cold snaps can be very damaging to new buds and growth.

Types of Damage

Low temperatures: The signs of cold damage can be confusing, since some damage may not be evident until months later. Leaves and tender shoots subjected to freezing temperatures or chilling damage appear water-soaked and wilted. These tissues will usually turn black within a few hours.

Bark Splitting: This type of injury occurs as a splitting of the stem or bark, typically near the base of the plant due to sudden changes in temperature. If damage occurs at the crown (base) of the plant it may not survive.

Frost Cracks: Sometimes called radial shakes, these appear as a long, deep, narrow crack running vertically up and down the trunk of the tree. These cracks are usually on the south or southwest side of the trunk, but can occur on any side. Young trees or older trees with smooth bark are most susceptible.



Sunscauld: This is an elongated canker on the trunk of thin-barked trees such as maple, willow, white pine, and linden. Sunscauld often develops on the south or southwest side of trees following a sudden exposure to direct sun. In winter, the temperatures on the sun-side of the trunk may exceed air temperature by as much as 20 degrees. This is believed to trigger de-acclimation of trunk tissue. The bark slowly darkens, turns reddish brown, and becomes rough. After a time the callus tissue eventually cracks and falls away. Sometime the outermost layer is damaged and a sunken area on the trunk will appear. Trees affected often have sparse foliage, suffer stem dieback, and growth is stunted.



Winterburn on Evergreens: A browning or scorched leaf tip or needle cluster on evergreen foliage in late winter and early spring is a form of winter injury. Browning usually occurs from the needle tips downward. Symptoms of winter burn are present on many narrow-leafed evergreens such as hemlock, juniper, pine, spruce and yew. It can also occur on broad-leaved evergreens such as boxwood, viburnum and rhododendron. Winterburn is usually caused by desiccation or loss of water through leaf transpiration by winter sun and winds drying the needles. Water in the stems and roots is frozen and unavailable to replenish the loss. A rapid or prolonged drop in temperature after a warm sunny day can also cause further injury to the plant.



Snow and Ice Breakage: Heavy snow and ice storms can cause damage by bending and breaking branches and buds. Multi-stemmed evergreens such as yews, arborvitae, and junipers are often the most prone to damage. The branches of many hardwoods, such as Siberian elm, maples, and birch may be seriously damaged in ice storms. Improper removal of ice or snow from the tree or shrub might increase damage. Removing ice encased on branches can cause additional damage and should not be attempted. Instead, allow ice to melt off naturally.

Care of Plants after a Freeze

Don't be in a hurry to prune or remove damaged plants and trees. Some may appear dead, but often they are not. Corrective pruning should not be started until the full extent of the damage can be determined.

Injury to foliage and tender shoots should be visible within a few days, but it may be several months before damage to larger limbs can be determined. Wait to see if any live green foliage reappears or gently scrape under the outer layer of the bark to see if green wood is present.

Once you have determined the extent of the damage, remove any dead wood. There is very little that can be done to revive plants suffering from extreme effects of freezing. Watering cold-damaged plants that appear wilted will not help them revive.

Minimizing Winter Damage

The best way to avoid winter damage is to select hardy tree and shrub species and cultivars. Use the plant hardiness zone map to select plants for particular locations. Within a hardiness zone, consider using only plants adapted to a lower number if the planting site has particularly harsh conditions.

Allow plants to harden off in the fall before cold weather arrives. Do not stimulate new growth by applying fertilizers or pruning in early fall. Plants that are diseased or deficient in nutrients are more susceptible to winter injury than healthy ones. Corrective measures should be taken in a timely manner so they won't affect cold acclimation.

Water plants during late summer and fall to prevent them from entering winter under drought or stress. Drought predisposes plants to winter injury and cankers.

Avoid placing trees and shrubs in low spots that can create frost pockets and can have rapid changes in temperatures. Flowers and leaf buds can be damaged when they are exposed to premature stimulation from warm days and then subject to freezing temperatures at night.

Potted plants should be packed close together and then covered with a translucent plastic sheet that does not touch the plants. Mulch or mound soil around the pots and balled and burlapped plants to insulate the roots. Protect plants in exposed locations by wrapping burlap around them.

For more information or to have your questions answered regarding winter injury to trees and shrubs contact the City of Powell arborist at 307-754-6971.