



ENVIRONMENTAL INJURY: WINTER BURN OF EVERGREENS

Home Garden Series

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Environmental Injury: Winter Burn of Evergreens

Winter burn is a type of environmental injury that occurs on evergreen trees and shrubs. This includes needled evergreens such as arborvitae, cedar, fir, juniper, pine, spruce, and yew and broadleaf evergreens such as rhododendron, laurel, mahonia, St. Johnswort and boxwood.

Symptoms of Winter Burn

Symptoms of winter burn, also called winter desiccation, range from brown, dry needle tips or leaf edges to the reddening or browning and death of entire needles or leaves (Figures 1 and 2). Winter burn may not be immediately apparent when it occurs because the affected foliage may not turn brown until the weather warms in late winter or early spring.

When winter burn is extremely severe, the foliage on entire branches and plants can be affected. However, winter burn damage is typically most severe on the sides of the plant more exposed to sun, wind, or both (Figures 3, 4A, and 4B).



Figure 3. The influence of sun-shade patterns on winter burn can be observed on this sunny January day in Pullman, Washington. The glass breezeway is on the east side of Johnson Hall and the broadleaf evergreens to the right (south) side of the picture are exposed to full sun while the plants on the left (north) side of the picture are shaded by a staircase structure.



Figure 1. Winter burn injury to the needles of pine. Photo by William Jacobi, Colorado State University, Bugwood.org



Figure 4A. Close up of the cherry laurel plants from Figure 3. This plant was located on the north or shaded side of the Johnson Hall landscape and shows no winter burn.



Figure 2. Winter burn injury to leaves of St. Johnswort, a broadleaf evergreen.



Figure 4B. The cherry laurel plant in this photograph was located on the south or sunny side of the Johnson Hall landscape and shows severe winter burn injury.

Cause of Winter Burn

Most needled and broadleaf evergreens retain their needles and leaves over the winter. These needles and leaves are capable of normal physiological plant processes. Because of this ability, they continue to transpire, losing moisture through the pore-like openings (called stomata) in their leaves.

Winter burn occurs when the water lost through the stomata in the needles and leaves isn't replaced at the same rate. This happens when there is not adequate available soil moisture for the plant's roots to absorb, when the plant roots are not well established as with newly planted evergreens, or when the soil is frozen making it impossible for the roots to absorb moisture. Areas where water settles and submerges root systems can also lead to winter burn because the roots are unable to function without oxygen and, as a result, cannot absorb water.

Direct sunshine, reflected sunlight, and windy conditions increase the amount of water lost through transpiration and thus increase the severity of winter burn.

Evergreens predisposed to winter burn include:

- Those with a south or southwest exposure
- Those overly exposed to winter winds
- Those in dry or poorly drained soils
- Newly planted trees and shrubs that do not have a well-established root system
- Those with root problems that restrict water uptake, such as girdling roots, restricted roots, or roots that have been planted too deep
- Those suffering stress from drought, insect, or disease problems
- Those with roots not protected by mulch
- Species poorly adapted to the climate and conditions of the site

Treatment of Winter Burn

Do not rush to remove injured portions of the evergreens. In some cases, only the current foliage is damaged and new healthy growth may develop from the buds on the twigs and branches the following spring. Scratch a small area of the bark with your fingernail or a pocket knife to determine if there is any green tissue underneath. If green tissue is visible, wait and see what may develop. However, once it becomes obvious what is still alive and what is not, you should remove the damaged tissues immediately with proper pruning cuts. For more information, see the WSU Extension Home Garden Series publication FS196E, [Cold Temperature Injury of Landscape Woody Ornamentals](#).

Prevention of Winter Burn

Proper watering of your evergreens throughout the growing season is essential to help prevent winter burn. Researchers used pyramidal, tall, hedge-type arborvitae to evaluate fall watering practices. They found that watering during summer and early fall dry periods to prevent drought stress from becoming severe was necessary to reduce the incidence of injury to this evergreen conifer (Pellett et al. 1980).

Periodically check for soil moisture during mild (above 40°F) fall and winter weather. If the soil is dry, water evergreen trees and shrubs deeply. This is particularly important in regions where there is negligible natural fall and winter precipitation or in areas that don't receive natural precipitation, such as underneath the eaves of a building. Do not irrigate when the soil is frozen. Watering is especially important for trees and shrubs planted within the last two years that may not have well-established root systems yet.

Coarse organic mulch applied over the root zone of trees and shrubs will help maintain soil moisture (Chalker-Scott 2007). Place a three- to four-inch-thick layer of mulch, such as wood chips or shredded bark, over tree and shrub roots in landscape beds. Put the mulch close to, but not touching, the base of the trunk. For information on using wood chip mulches see WSU Extension publication FS160E, [Using Arborist Wood Chips as Landscape Mulch](#).

In wind prone areas of the landscape, you can also protect smaller evergreen shrubs and trees by constructing a screen made with wood slat fencing, burlap, or canvas on the sunny and windward sides to buffer the wind and shade the plant. Place the screen approximately two feet away from the plant.

Reliable snow cover during the winter can help protect evergreen foliage from winter burn. Foliage on the lower part of the evergreen cherry laurel shown in Figure 5 was blanketed under snow and protected while the upper portion of the plant, above the snowline, was damaged. Light, dry snow is a preferred insulator. Heavy, wet snow should be carefully removed before it weighs down and bends or breaks branches.

Avoid planting evergreens in the following areas:

- Southern and southwestern exposures
- Wind prone locations
- Where winter precipitation pools and submerges plant root systems
- Where plants are prevented from receiving natural precipitation because of structural features like eaves or overhangs



Figure 5. Reliable snow cover helps to protect evergreens like this cherry laurel from winter burn.

References

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- Pellett, H., R. Hummel, and L. Mainquist. 1980. Relationship of Fall Watering Practice to Winter Injury of Conifers. *Journal of Arboriculture* 6(6): 146–149.

Additional Resources

- Chalker-Scott, L. 2015. [Using Arborist Wood Chips as Landscape Mulch](#). *Washington State University Extension Publication* FS160E. Washington State University.
- Hummel, R.L., and M.C. Ophardt. 2016. [Environmental Injury: Cold Temperature Injury of Landscape Woody Ornamentals](#). *Washington State University Extension Publication* FS196E. Washington State University.
- Missouri Botanical Garden. [Desiccation or Winter Burn](#).
- Relf, D., and B. Appleton. 2010. [Managing Winter Injury to Trees and Shrubs](#). *Virginia Cooperative Extension Publication* 426-500. Virginia State University.
- Swanson, B.T., and R. Rideout. 2013. [Protecting Trees and Shrubs Against Winter Damage](#). University of Minnesota Extension.



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