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Winter Injury of Ornamentals

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in yard and garden

Control

PLANT DISEASES

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WINTER INJURY OF ORNAMENTALS

The term "winter injury" is used to describe several types of plant damage caused by environmental conditions during late fall, winter or early spring. Damage ranges from a marginal scorching of leaves to complete killing of plants. Winter injury may occur on deciduous plants as well as evergreens. However, in early spring, damage is usually more apparent on evergreens.

It is often difficult to differentiate winter injury from disease, insect or chemical injury. Injured plants may appear normal until 3 or 4 weeks after new growth has commenced in the spring. Occasionally, damage does not become apparent until 1 or 2 years after the injury occurred.

Desiccation, low temperature and mechanical damage are the three basic types of winter injury.

Winter Desiccation

Dormant plants respire in the winter; even during the coldest periods. As a result, small amounts of water are lost from buds and evergreen leaves. The rate of water loss increases with rising temperatures, drying winds and/or full sunlight. When the ground is excessively dry or frozen, water may be lost from the leaves and buds faster than it can be replaced through the roots. Excessive desiccation kills bud and leaf tissues from the edges progressively inward. Damage is usually more severe on plants exposed to full sunlight and/or drying winds.



Figure 1. *Rhododendron* leaf injured by winter desiccation. Excessive desiccation may kill cells at the tips and margins of evergreen leaves.

Pine needles damaged from winter desiccation turn yellow, then reddish brown from the tips downward. Branch tips of taxus, juniper, arborvitae, etc. may be killed. Boxwood leaves become bronzed or bleached yellow. The edges of *Rhododendron* leaves appear burned (Fig. 1). Deciduous trees and ornamentals may fail to leaf out properly in the spring or the tips of branches will appear brown and dried out.

Low Temperature

As a rule, cold temperatures alone do not injure plant species that are well adapted to a given area. Abnormally cold temperatures, however, may cause injury. Excessive and rapid fluctuations in temperatures cause most of the injuries; not low temperatures alone.

The ability of trees and shrubs to withstand cold temperatures is dependent upon the winter hardiness of the plants. Winter hardiness is influenced by soil drainage, location, natural protection, character of root system, environmental conditions during the summer and fall, and species of plant. A cool summer followed by a warm early fall with abnormally low temperatures in late October or early November may result in improperly hardened plants and cause winter injury. Excessive application of nitrogen fertilizer, or pruning in August or September may promote new growth that will not mature and may be damaged by freezing.

Root injury occurs most commonly during winters of little snowfall or in soils bare of vegetation. Plants with root systems dam-

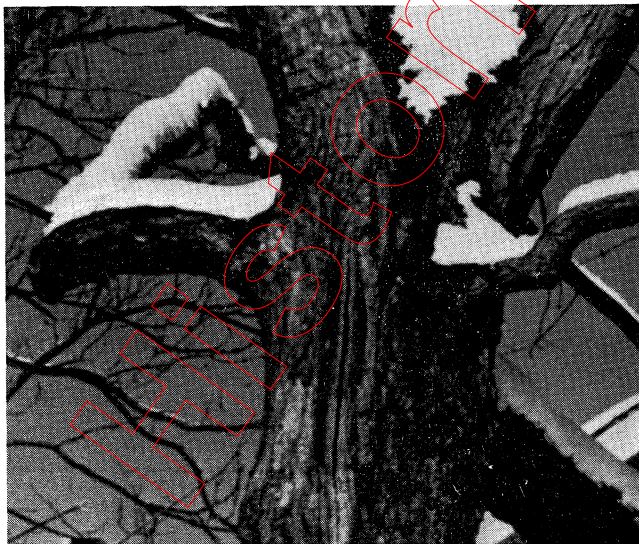


Figure 2. Frost-cracking causes a vertical separation of wood and bark. Damage usually occurs on the south or west side of trunk or exposed limbs.

aged in the late summer by disease, insect, drought, etc. may be more susceptible to winter injury. Roots growing in poorly-drained soil are more likely to freeze than those growing in well-drained soil. This is especially true of pine tree roots. The effects of frozen roots are seldom seen until the following summer, when damaged plants may wilt and die.

Young, smooth-barked trees such as apple, elm, horse chestnut, London plane, linden, maple, poplar and willow are susceptible to frost-cracking (Fig. 2). Damage usually appears on the south or west sides of trunks or exposed limbs. Frost cracks occur when winter sun causes a differential expansion of wood beneath the bark. The temperature of wood beneath the bark on the sunlit side of a tree may be as much as 30 degrees F. warmer than the surrounding air temperatures. The unequal expansion and contraction of the wood may cause longitudinal splits in the bark and wood. Such injury results in unsightly scars, and provides entrance for wood-rotting organisms. Frost cracks may reopen year after year.

Frost injury occurs when temperatures dip below freezing in late spring after new growth is well-advanced. Frost injury is characterized by the rapid wilting and browning of new leaves, shoots or flowers. Leaves may be puckered or distorted if frost occurs just as buds are breaking.

Mechanical Injury

Multi-stemmed evergreens such as boxwood, juniper and taxus tend to spread and break under a load of ice or snow. Deciduous trees with soft brittle wood such as soft maple, chinese elm, tree-of-Heaven, boxelder and birch may be seriously damaged by ice. Ice coatings may increase the weight of a branch up to 40 times. Improper removal of ice or snow from a tree or shrub often increases injury. Ice-laden branches should be propped with 2 x 4 boards or other suitable materials. Never break ice off branches with a broomstick or similar device.

Control

Since weather cannot be controlled, it is necessary to take precautions that will reduce the possibility of damage.

1. Use plant material adapted to your area.

2. Plant ornamental trees and shrubs in well-drained soil.

3. Water trees and shrubs before the first freeze to insure the plants have sufficient moisture in the soil. This is especially important if a dry summer or fall occurred and where plants are situated under the overhang of houses.

4. Do not fertilize trees or shrubs in late summer or early fall. If fall application is desired, wait until trees or shrubs are dormant.

5. Mulches of leaf mold, peat moss, corn cobs, or other suitable materials around the base of trees and shrubs will increase moisture retention and decrease the depth of the frost line. They also prevent alternate freezing and thawing of soil once it is frozen. Mulches should be pulled away from the trunks of trees in the fall to allow this area to harden-off properly.

6. Wrap the trunks of young, thin-barked trees with burlap, sisalkraft paper, or other tree wrapping materials to prevent frost cracks and sunscald.

7. Tie branches of multi-stemmed evergreens together with strong, pliable cord to prevent breakage from ice and snow.

8. Erect canvas, plastic, burlap or slat screens on the south and west sides of exposed evergreens to prevent desiccation. The screens should be at least 2 feet away from the evergreens. It is advisable to use plants that do not require this type of protection in severely-exposed areas.

9. Prune dead and broken branches and twigs in early spring or as soon as they appear. Paint wounds with shellac or other wound dressing. Application of a complete fertilizer in late March or April will help stimulate new growth.

10. Anti-transpirants are of limited value for general winter-long protection. They break down rather rapidly requiring several applications during the winter months. Temperatures must be above 35 degrees F. for application. In specialized cases, however, anti-transpirants may be useful in preventing winter desiccation. Use according to label directions.

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