



The Home Landscape

Winter Injury to Landscape Plants



Homeowners hoping to safeguard their ornamental plants from winter injury can take certain precautions to prevent or reduce seasonal hazards. Plants native to the area, those imported from a similar climatic zone or those that have become acclimated to our type of winter present few problems. When planted in a location suitable for their cultural requirements, they need little or no protection other than the natural, seasonal changes of reduced growth or dormancy.

Semihardy plants (many broad-leaved evergreens, a few narrow-leaved evergreens and some nonevergreens) susceptible to winter injury include those native in a sheltered location or those native to a milder climate. Because these plants have desirable ornamental features, they are included in landscape plantings even though they may require protective measures to survive winter conditions.

Considerable injury may be avoided by selecting favorable locations for plants and by following good cultural practices. The latter should include mixing liberal amounts of organic matter into the soil to promote adequate drainage, greater penetration of air and water and better moisture holding capacity which will increase and deepen root

growth. A systematic program of pruning will help to avoid much of the injury often caused by ice and wet snow.

SPECIFIC INJURIES AND PROTECTIVE MEASURES

The following problems will affect various landscape plants, and, in several instances, the preventive measures will protect against more than one hazard.

Autumn Frost Injury to Late Season Growth—If new growth produced during the early fall is not sufficiently hardened to survive a sudden drop from mild to below freezing temperatures, cell walls may rupture and considerable late-season growth may be killed. Much of this injury may be avoided by not applying fertilizer after June, thus minimizing late summer-early fall growth. Semihardy plants, such as some types of azaleas and rhododendrons, are especially susceptible to this injury. When very small, these should not be mulched during late summer, since the heat radiated from the ground may be sufficient to prevent freezing of the new growth.

A similar situation sometimes develops when a tree or shrub, fertilized in the spring, has its usual flush of new growth delayed by late spring and summer drought. Late summer rains finally induce this delayed growth, which may be damaged seriously during the fall freezes.

Excess Loss of Moisture—The needles or leaves of evergreens transpire some moisture even during the winter months. The water loss is greatest during periods of strong wind and also during temporary periods of

sunny, mild weather. When the temperature falls to the low twenties, the top edges of rhododendron leaves curl inward toward the bottom midrib, and the leaves hang down. This reduces transpiration. Even well-established, normally hardy, narrow-leaved evergreens, such as yew and hemlock, as well as some nonevergreen trees and shrubs, may show injury from prolonged periods of extreme cold and wind. These conditions also sometimes injure the flower buds of azalea, dogwood, forsythia, magnolia, peach and others. If the water supply available to the plant roots is inadequate to compensate for that lost by leaves, the resulting injury may range from browning or burning of the leaf margins, to desiccation (drying out) of the smaller twigs or perhaps death of the entire plant.

Three situations may contribute to injury resulting from loss of moisture. When evergreens are transplanted, many of the smaller, moisture absorbing roots are severed when the plants are dug. If these shrubs are planted in the late fall, the soil soon becomes too cold for growth of new roots needed to compensate for those lost in digging. Plant easy-to-move, narrow-leaved evergreens, such as yew, arborvitae and juniper, in September or early October. Plant hemlock and broad-leaved evergreens only in the spring, to allow a full growing season for the regrowth of roots. A two- to three-inch mulch applied before the ground freezes will keep the soil warm enough to prolong root growth.

When September and October rains have been insufficient to leave

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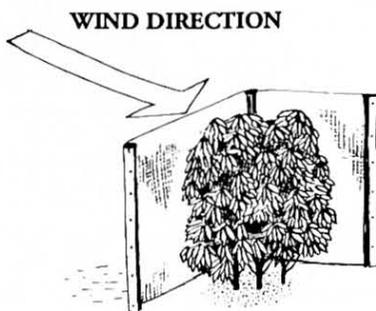
the soil well supplied with water, give plantings a deep soaking before the plants show water stress.

During severely cold weather, the ground may freeze to a depth beyond the extent of the root system, thereby cutting off the supply of water. The insulating qualities of a mulch will reduce this deep freezing and will prolong the period before the penetration of frost stops root growth and water absorption.

Wind and Sun—Most broad-leaved evergreens and other semi-hardy plants should not be located in areas exposed to sweeping winter winds, which may cause excess moisture loss (see Excess Loss of Moisture). Especially affected are azalea, daphne, fire-thorn, American and Japanese holly, Oregon hollygrape, English ivy, leucothoe, mountain laurel, pachysandra, pieris, rhododendron, Canadian yew and leatherleaf viburnum. These plants also are similarly affected by heat generated by the direct rays of the warm sun often prevalent in February and March. It may cause the stomates on the lower side of the leaves to open and transpire moisture. The sun also may prematurely stimulate the opening of the flower or leaf buds, which might then be killed by freezing night temperatures. Additional heat often results from sunlight reflected from light colored buildings or fences, as well as from prolonged exposure to bright sunlight reflected onto plants from snow. This reflected sun injury sometimes appears on hemlocks, junipers, yews and other normally hardy plants.

Plants susceptible to injuries from sun and wind should be planted only in protected, partly shaded or sheltered locations. These include the southeast, east or northeast side of a building, fence, wall or other form of windbreak. The latter may be either a permanent barrier or a temporary windbreak erected for the winter months, such as a lath snowfence or a strip of burlap attached to poles.

When already growing on the sunny south or southwest side of a building, these less hardy plants can be similarly protected from the winter sun and winds by either a burlap, green plastic mesh or wood-slatted snow fence barrier encircling each plant. Another type of shield can be made from evergreen boughs (fir, hemlock, pine or spruce), with their cut ends forced into the ground near



Temporary windbreak of burlap and poles.

the base of the plant and the tops gathered against the plant with twine. A complete wrapping with straw and burlap is sometimes used. Unfortunately these protecting barriers detract from the natural beauty of the shrubs. Small plants may be covered with a slotted peach basket anchored to the ground by pieces of heavy 10-gauge wire, bent to hook over the rim.

Alternate Freezing and Thawing of the Soil—Newly planted or even established small, shallow-rooted plants are often injured when alternate freezing and thawing raises or heaves the plant from its firm contact with the soil and exposes some of the root system to drying winds. Small roots are often severed, thus reducing the supply of water to the plant.

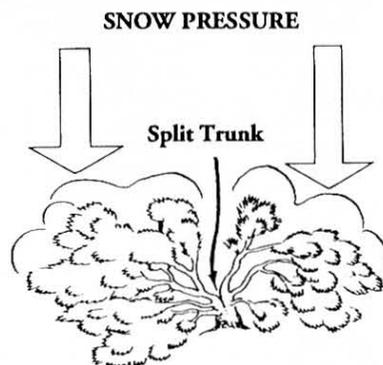
One precaution against this heaving injury is to promote deeper penetration of the root system by providing a well-drained (for good aeration) and properly fertilized soil. Spring planting is recommended for shallow-rooted or small plants to give them a maximum period for the root development necessary to minimize winter heaving. A two- to three-inch layer of organic mulch such as peat moss, leaf mold, pine needles or sawdust will maintain a more uniform temperature and reduce the heaving action caused by sudden freezing of the soil. Contrary to popular belief, mulching does not prevent eventual freezing of the soil. Salt hay or evergreen boughs are often used as a protective winter mulch for herbaceous perennials. A cover of snow may provide similar protection. Evergreen ground covers, such as pachysandra or vinca (myrtle or periwinkle), when planted in the space among ornamental shrubs and trees, serve as a living mulch.

Snow and Ice Damage—The two basic causes of damage to landscape plants by snow and ice are its weight and careless removal.

The natural shape of either upright or horizontally-spreading, narrow-leaved evergreens can be permanently destroyed by the heavy weight of snow or ice. Depending upon the amount and duration of weight, injury varies from a temporary bending of the branches to a permanent separation and opening-up of the top of the plant. It can also result in breaking of branches and splitting of the main trunk.

To lessen the danger of this injury to upright, multiple-stemmed plants, such as Hicks yew, juniper and pyramidal arborvitae, restrictive pruning of top-heavy portions is beneficial. Remove the longest terminal branchlets and prune back the rest of the top without destroying the irregular, natural shape. For further protection, hold the upright branches together in their natural position by carefully lashing the individual stems to each other with heavy twine. Remove it in early spring to prevent any girdling of the bark. A faster, but less attractive method of preventing these upright branches from being separated is to wrap the whole plant with a spiral winding of twine (preferably of an inconspicuous color).

Among the particularly susceptible, horizontally spreading, narrow-leaved evergreens are large specimens of such irregularly graceful plants as Pfitzer juniper and spreading yew. The weight from snow or ice covered branches sometimes causes the main trunk to split down the center. This injury and the breaking of smaller branches also may be largely prevented by an annual, systematic removal of the terminal twig of the most rapidly growing branches. The



resulting more compact plant will be more attractive and often may be retained in a particular location for many additional years.

The branches of foundation plants located within range of snow sliding from large steeply-pitched roofs often are broken or crushed. Even though some homeowners may object to their appearance, board roof shields erected on a slant to direct falling snow away from the walls of the house may protect valuable plants.

SNOW AND ICICLES FALLING FROM ROOF

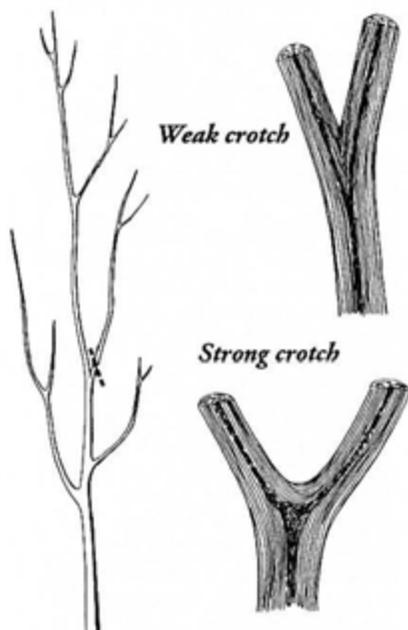


Snow melting from a roof may cause two types of ice injury to the foundation plants below. Increasingly large icicles, if allowed to hang from eaves, may fall of their own weight and break some of the plant's branches. Another type of injury results when melting snow on the roof drips from the eaves and refreezes on plants. Branches may be permanently bent or broken by the weight of the ice.

Forked, wooden stakes or poles (padded on top to prevent bark injury) are sometimes used as props under large, horizontally spreading branches of more mature evergreens and, also, under small deciduous trees. They help support the additional weight of the snow. When these props are used among the branches of dense evergreens, such as mature Sargent weeping hemlock or Pfitzer juniper, they can be installed from such an angle that they are nearly invisible.

If not frozen to the branches, newly fallen snow on either upright or spreading evergreens may be carefully swept from the drooping boughs. Use a "soft" broom and always brush upward toward the tips of the branches to avoid breaking or splitting them. This removal also may prevent secondary damage sometimes caused by the snow's partially melting and then refreezing.

The damage from the weight of snow or ice on large trees may range from minor breaking of the ends of smaller branches to permanently bending larger branches. The latter deforms the natural shape of the tree, tearing branches from the main trunk or splitting the entire tree. One way to lessen injury, especially on younger trees, such as maple, is to prevent the development of more than one main trunk. If two parallel leaders are allowed to grow, they may form a weak, narrow-angled, V shaped crotch. The wood in the "V" is weaker than that in a "U" crotch, because the branches are so close together that fewer wood cross fibers connect the two trunks. As the two main stems increase in diameter, with only bark between them, more pressure is placed on the small amount of wood below the original crotch. This is apt to split under strain.



Mature trees with large semi-upright branches in danger of splitting at a weak crotch may be reinforced by having screw rods installed by an arborist.

Damaged trees should be repaired as soon as weather permits. Carefully remove broken branches, making cuts back to the next larger branch of trunk. See *Pruning*, 68-26, for more information.

Snow removal often damages plants located near walks and driveways. Do not throw snow onto the tops of plants where it can bend or break the branches. If the drive and

walk are to be plowed, avoid injury to nearby plants by installing tall guide stakes to show the operator the exact route. In planning the initial home landscape design, locate trees and shrubs far enough away from walks and drives to allow ample room for snow removal. Plant shrubs far enough from a garage to avoid piling snow from the doorway on to them. In choosing materials for entrance walks, service walks or driveways, select those with relatively smooth surfaces from which snow may be shoveled or plowed easily.

Considerable quantities of salt, applied either directly or mixed with sand, are used each winter to melt ice on pavements. When applying, do not let this salt come into contact with plants. Do not sweep salt-saturated sand from the entrance porch onto nearby shrubs. Depending upon the quantity and frequency of contact, the salt may cause a burning discoloration of evergreen foliage. Avoid applying salt to pavement near trees or shrubs, since the salt leached into the soil may injure roots.

Stem Girdling—During the winter when other food supplies are scarce, mice or rabbits gnaw and eat the bark from the trunk or main stems of fruit trees and ornamental shrubs. These include apple, dogwood, euonymus, firethorn, juniper or yew. Injury is often more severe during those winters when snow covers the lower portion of the plant for a prolonged period. Damage varies from loss of bark on only one side, to complete girdling (removal in a wide collar) of all the bark along several inches of the stem or trunk. The first type of damage, may be able to repair itself. If the bark of a single-stemmed tree or shrub of a single-stemmed tree or shrub is entirely girdled, the downward conduction to the roots of food materials manufactured in the leaves will be cut completely. Eventually, the plant will die unless the area is repaired. A type of emergency conduction "bridge" in the form of several pencil-sized scions (branches) may be grafted in such a manner that the cambium tissues of the scions unite with those of the bark above and below the wounded area. See Horticulture Fact Sheet #28, *Bridge-Grafting and Inarching Damaged Trees*, 93-7, for instructions on the procedure.

Three practices may be used to prevent stem girdling. A wire barrier sleeve of galvanized 1/4-inch hardware cloth may be installed around the trunk, from a point just below ground level to at least 18 inches high. Chemical repellents may be sprayed or brushed onto the lower portions of susceptible plants. Fence enclosures are sometimes erected around groups of valuable specimen plants to keep out rabbits.

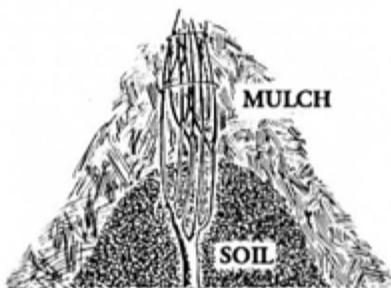
Frost Cracking—A sharp temperature drop from a sunny daytime high to a very low night temperature may freeze water within the tree trunk. During prolonged, cold winter weather the resulting changes in internal pressures sometimes cause cracking of the bark and wood fibers. Longitudinal cracks may develop on the trunks of vigorously growing trees such as horsechestnut, linden, maple and London planetree. Although these cracks apparently close when warmer weather arrives, wood fibers within may not grow together again. If this splitting occurs during several winters, the resulting internal decay may seriously damage the tree. Recommended treatments include the installation by an arborist of supporting bolts to prevent future splitting and/or shading the south to west side of the trunk to reduce winter warming.



Winter Killing of Roses—The canes of climbing as well as bush types of roses are often partially or completely killed by winter winds and low temperatures. Make some provision to protect these canes, since the flower-

ing shoots producing spring blossoms develop only from canes grown the previous season. Do not prune any of these vigorous, new canes until spring, when the extent of winter damage can be determined. In late fall, carefully remove branches of less hardy types of climbing roses from their supporting arbor or fence. Lay them upon the ground, and cover with a loose material, such as soil, evergreen boughs or straw. Leave the more hardy types on their supports until spring, when winterkilled or surplus canes should be removed.

Unprotected canes of garden bush roses, such as hybrid teas, are often partially or entirely winterkilled. If pruned severely in the fall, any fur-



ther injury to canes during the winter could cause their loss to ground level and the death of the plant. To protect further against this danger, hill eight to 10 inches of soil around the plant in the fall just before the ground freezes. After freezing starts, mulch the mound with straw, hay, leaves or evergreen boughs. Tie tall canes together, as shown, to prevent ice or snow damage. Provide additional protection by wrapping the tied canes with evergreen boughs, straw or a burlap snowfence barrier. In the spring, level the soil mound and prune any dead, injured, weak or surplus canes.

Late Spring Freezing—The lush new, feather growth of narrow-leaved evergreens, such as yew and hemlock and broad-leaved types, such as pieris, is often killed by late spring frosts. When frost damage is forecast,

homeowners may help prevent this injury by covering smaller plants with burlap or similar material or, if available, by operating a sprinkler irrigation system to keep the temperature above freezing. Injured growth turns blackish-brown and should be removed to improve plant appearance.

REPAIRING WINTER DAMAGED PLANTS

After an unusually severe winter, many plants may show substantial injury. Among the damage symptoms commonly seen are discolored, burned evergreen needles or leaves, dead branch tips and branches, heaved root systems and broken branches.

At winter's end remove only those branches that are broken or obviously dead. Do not remove branches when scraping the outer bark reveals a green layer underneath. The extent of winter injury can best be determined after new growth starts in the spring. At that time, prune all dead twigs or branches back to within one-quarter of an inch above a live bud, or to the nearest live branch. If the discoloration on narrow-leaved evergreen needles is not too severe, they may regain their green color, or new foliage may be produced on the undamaged stem. Broad-leaved evergreens showing leaf damage will usually produce new leaves, if branches and vegetative leaf buds have not been too severely injured. Damaged leaves may drop or be removed. Replant smaller plants with root systems partially heaved out of the ground as soon as the soil thaws. Unless the root system is small enough to be pushed easily with the fingers into the soft soil, dig the plant, retaining as much as possible of the root system within a soil ball, and replant it.

A light application of fertilizer to the soil around winter damaged plants, accompanied by adequate watering, will usually induce new growth to compensate for winter injuries.