

# Winter injury

Understanding the causes of winter injury of landscape plants will help you avoid the effects, says a *Weeds Trees & Turf* technical advisor.

by Douglas J. Chapman

To consider protection against winter injury for landscape plant material, you have got to understand the causes of winter injury: low temperature, rapid temperature fluctuation, degree of dormancy, desiccation, and physical injury.

Low temperature injury is generally accepted as the critical temperature at which the plant tissue is killed.

Frequently, the temperature differs for flower buds, vegetative buds, stems, and roots. Plants native to northern areas—the Great Lakes region (Michigan, Wisconsin) and the Northeast—are generally capable of withstanding low temperatures of minus 25 to 35 degrees Fahrenheit before cell freezing and tissue death occur.

The ability to withstand a low cardinal temperature is controlled genetically and is affected by the amount of carbohydrates accumulated within the plant.

Generally, the higher the plant's accumulated carbohydrates, the lower the temperatures it will tolerate.

## Temperature fluctuation

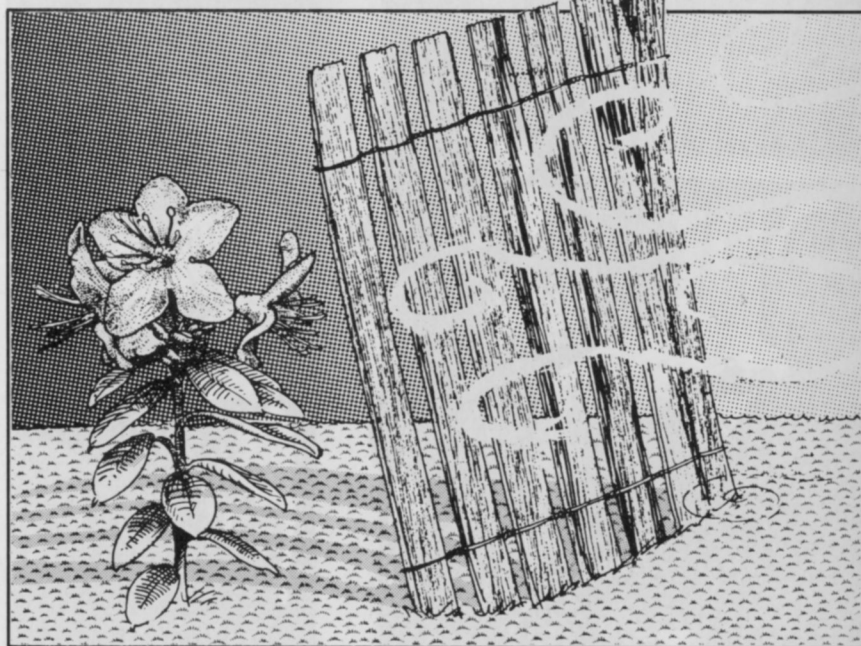
Rapid temperature fluctuation is frequently a more important factor in winter injury. When the temperature drops rapidly after several warm days, some injury may occur.

This type of winter injury occurs during February and March when the temperature may drop 30 degrees or more in one day.

Frequently, hardy plants are damaged. Often heavy mulching of the root system with organic matter (bark, compost, peat moss) is used to protect these plants.

Mulch acts as does the insulation in our homes to modify temperature fluctuation.

Mulch should be put on just prior to soil freezing to limit not only the effect of cold temperatures but also to help keep the soil cool longer in the spring, therefore delaying premature



commencement of growth.

Plants with a rather tender top—roses, for example—can be protected by mulching the crown and the upper portion of the plant with straw or similar material.

This crown mulch is designed to slow the rate of temperature fluctuation, thereby protecting the plant's flower and vegetative buds from damage.

## Dormancy and desiccation

Degree of dormancy also impacts whether a plant will be injured by low temperatures.

Plants that go dormant due to the photoperiod include many of the more northern native species (sugar maple, red maple, red oak, *Viburnum prunifolium*). They are slow to break dormancy and are most often tolerant of early spring temperature thaw.

Plants that go dormant due to cold temperature can lose dormancy quickly (forsythia, hydrangea) and can be dramatically injured during January or March thaws.

Desiccation is a particularly severe

problem on narrow and broad leaf evergreens, occurring in late February or March when the soil is still frozen, air temperature is high, and the sun is shining.

The foliage starts transpiring, or losing water. Yet the soil is frozen and the roots are unable to absorb water.

To protect against this type of winter injury, one should consider either companion plantings or shielding the individual plants.

A fine example of companion planting is planting rhododendron with pine, allowing the rhododendron to be understory to the pine tree.

A good rule of thumb is the smaller the leaf of the rhododendron (*R. carolinianum*, *R. laetivirens*), the more tolerant it is of sunlight. Conversely, the large leaf rhododendrons (*R. catawbiense* or *R. maximum* cultivars) are less tolerant, thus requiring more shading.

## Wind protection

Shielding is nothing more than placing wind breaks on the windward side of the plant.

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Shielding can be made of snow fence, burlap, or branches of discarded Christmas trees. You can use anything that decreases the velocity of drying winds or provides shade from the bright late February or early March sun.

A list of plants you may consider protecting includes rhododendron, andromeda, mahonia, holly, yew, and upright juniper.

### Physical injury

Physical or mechanical injury may be the result of snow, ice, or rodents.

Many plants, such as yew and spruce, can be damaged due to the weight of heavy, wet snow. This causes discontinuity in the vascular tissue and renders the plant susceptible to injury during the following growing season.

Ice injury (which may be simply broken branches or a bent over plant), in contrast to heavy, wet snows, is hard to control.

The heavy, wet snow can be knocked off the plant within 24 hours but the injury caused by ice can be catastrophic as there is little or no pro-

tection you can offer.

Rodent injury can be devastating. They prefer a few favorite plants including the rose family (roses, apples, pears), cherry trees, *Euonymus alatus*, and yews.

## Rapid temperature fluctuation is frequently a more important factor in winter injury.

A resident cat may be the best control for this type of injury.

Another solution is wrapping the lower 18 inches of the plant with 1/2-inch hardware cloth.

Furthermore, putting out poison baits can reduce populations to where injury is essentially non-existent.

### Other alternatives

Plants, especially broad leaf and narrow leaf evergreens, should be deeply watered just prior to the freezing of the soil.

This deep watering helps supply

sufficient moisture to plants that continue to transpire, enabling the plant to replenish some lost moisture that has transpired during the cold winter months.

Furthermore, mulching the plant just prior to soil freezing allows an opportunity for the roots to function, thus surviving long cold/dry periods.

When considering winter protection, you should remember that you are trying to:

- minimize temperature fluctuation;
- reduce water loss due to transpiring—be it by use of anti-transpirants applied to the foliage or shielding the plants;
- provide moisture during periods of stress by deep watering plants.

As it has been aptly said, "Winter protection is nothing more than modifying the extremes that plants will be subjected to, therefore, minimizing the chance of winter injury and allowing us to grow plants farther north than their range would indicate and adaption allows."

Understanding the plant's requirements and why winter injury occurs gives the grounds manager a course of action to minimize the impact of winter's extremes. **WT&T**

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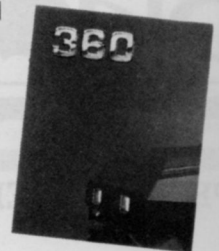
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