

## MINIMIZING WINTER DAMAGE OF TURF

Winter damage is seldom caused only by an exposure of the turf to low temperatures. Commonly, the turf is weakened by one or more external events which lowers the tolerance of the grass to low temperature. With this lowered tolerance, injury can result from relatively short exposures to freezing temperatures.

An explanation of these "external events" is necessary, therefore, to totally understand winter damage. The most common problem is the desiccation of plant tissue. When dry winds remove moisture from leaves and stems, minor damage occurs and recovery in spring is rapid. If the meristematic tissue of the crowns is dehydrated, the damage is much greater and a serious loss of turf results. The mechanisms of water loss are the same in both cases. Simple transpiration is one method of loss. Transpiration losses only occur when free water is available in the soil for uptake by the roots. When the moisture level in the turf tissue is low and the roots cannot absorb water from the soil, a more serious mechanism of water loss occurs. As the air temperature drops, ice crystals begin to form in the intercellular spaces but not within the living cells. This causes water to move from within cells across to cell membrane to the intercellular spaces. A water deficit can result within the cell. Hardened cool-season turfgrass can tolerate this phenomenon well. Damage occurs, however, during early spring when the hardening process reverses. The turf can no longer tolerate sharp drops in temperature and damage results. Insulation from an extreme temperature drop, therefore, is most critical in late winter. Snow is a good insulating material which does not require removal in the spring. Snow fences can be erected in the fall to help the accumulation of snow on crucial areas (perennial ryegrass turf, tall fescue turf, open areas, etc.). Where expected snowfall is minimal, other materials (leaves, straw, bark chips, etc.) can be used to provide insulation. Follow recommended procedures to prevent snow mold when using any cover material.

Excessive water is another leading cause of winter damage to turf. In areas of poor drainage, or where underlying soil is frozen, water can accumulate during thawing periods. Thawing can occur in some locations under intense sunlight while air temperatures remain below freezing. If these areas remain under water for an extended amount of time, the grass crown tissue takes up water. Grass tissue in this hydrated state is more sensitive to low temperature. A sudden drop in temperature below 20 degrees F can cause serious losses. Compacted areas (green fringes, tees, etc.) are quite prone to this type of damage.

What can be done to prevent these catastrophies? First, don't panic! Many damaged areas will recover slowly if managed properly. Find the extent of damaged area, or better yet, determine first if there is any winter damage. If you have had damage in an area before or if you suspect a likelihood of trouble, remove several plugs of turf as soon as the soil allows. Place the plugs in a greenhouse or in your shop, allowing them to warm up slowly and watch for new growth. After several weeks, you will know if there is nothing to worry about, you missed the damaged areas, or you can begin to plan for renovation. Despite the results, it is nice to know before the growing season.

It is not too late to prevent some potential winter damage. Remember, most damage occurs during late winter or early spring during periods of thawing weather. Don't try to save everything; concentrate your efforts on the critical areas

where you suspect problems. Where standing water is a problem, try to remove it slowly.

Snow and ice preventing natural runoff should be removed or grooved to release the water. One alternative to physical methods is to apply a coating of dark material (activated charcoal, milorganite, etc.) to the ice or snow and let the sun do the rest.

Ice cover over bentgrass or Kentucky bluegrass is generally not a serious problem. Other cool season turfs, especially perennial ryegrass can be seriously damaged by an ice cover of moderate duration. Large continuous sheets of ice over perennial ryegrass turf should be removed mechanically or as previously outlined.

If too little water is the problem, be cautious in applying more. Where snow cover is lacking, straw, leaves, or other mulching materials can be used to buffer the turf from a sudden drop in temperature and minimize further water loss. Use only mulching materials that are weed seed free. Weeds will tend to be a problem in damaged areas, therefore, tupersan should be used in conjunction with seeding Kentucky bluegrass. Broxomynil can be used to control immature broadleaf weeds after germination.

Plan ahead for next winter. Correct drainage problems this season for areas receiving winter damage. Be certain the soil moisture levels are adequate next fall, before draining the irrigation system. Don't aerify critical areas late in the year and consider using a mulch where snow cover is minimal. Mulches also promote early green-up in spring. Utilizing these few procedures, winter damage to turf should be a problem of the past.

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