



Winter Protection Through Sound Management

Tar paper roofing nails are all that are required for stabilizing plastic screening.

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Despite the fact that low temperature kill, desiccation, and snow mold are all types of winter injury, they are very different in nature. Therefore, methods of eliminating or minimizing the effects of each form of winter injury differs.

Variety and Specie Tolerances

Different species as well as varieties of turf-grasses have varying degrees of winter hardiness. Many of our problems could be eliminated at the start by selecting turf varieties with a greater degree of winter tolerance. In the northern areas the selection of a turf variety, such as Toronto, with a proven tolerance to winter injury would reduce the amount and severity of problems. The selection of winter-hardy varieties is also important in the transition zone where warm-season grasses are used.

Management

Although other factors are important, management plays the key role in winter survival. The management operations you employ all season affect the winter hardiness of your turf areas. Management is particularly critical in the late

summer and early fall. In the Northeast, fertilization should be stopped by mid-September to allow adequate time for the turf to harden off. If the turf is not forced by overstimulation with readily available sources of nitrogen or frequent irrigation, it will gradually reduce metabolic activity and establish a hardened state. In this hardened state, the plant has a minimum of unbound water which enables it to withstand the low temperatures which occur during the winter.

In all cases, traffic should be avoided on dormant turf. This should be particularly emphasized during wet, slushy periods. In addition to attrition, traffic packs the wet snow in close proximity to the crown tissue. As the temperature drops and the wet snow turns into ice, injury is eminent. This brings to light the importance of good drainage. By eliminating poorly drained areas, the superintendent can solve many of his perennial problems.

A regular program of thinning and topdressing should be underway to keep thatch in the desired proportions. Excessive thatch promotes elevated crowns and restricted roots. Elevated

crowns are subject to low temperature kill while restricted rooting increases the susceptibility of the turf to desiccation.

Potassium should be applied early in the fall if it is to benefit the turf. If the muriate or sulfate of potash is not applied early enough to come into equilibrium with the soil, it may actually do more harm than good. These materials increase the salt index of the soil solution at a time when its effects can be magnified by freezing. High salt concentrations will serve to increase the detrimental effects of winter injury.

In northern areas it has been the general practice to recommend late spring or early summer weed control. All herbicides adversely affect the metabolism of the turf to some extent, and it is not advisable to weaken the turf immediately before winter.

Late fall renovation and seeding should be avoided. Adequate time should be allowed for the turf to recover or become established prior to cold weather. Young seedlings are easily damaged by the thrusting action of freezing and thawing.

The old practice of aerating greens late in the fall and leaving the aeration holes open over the winter is a real gamble. Although this practice improved drainage around the crowns of the turfgrass, it increased the threat of desiccation. If late fall aeration is needed, it is advisable to topdress following the aeration. It has been our observation over the past few seasons that a late heavy topdressing at about twice the normal rate (2/5 yard per 1,000 square feet) has provided an extra measure of protection during winter.

Another drawback to fall fertilization is the reported increase in snow mold activity. The snow mold organisms, although not obvious, are active during the fall. An early fungicide treatment, about the time the leaves fall, has been shown to be the single most important treatment for the prevention of snow mold. A second application in early winter prior to permanent snow cover generally improves results.

It is obvious that turf areas should be mowed as long as leaf tissue continues to develop. Unmowed turf provides an excellent environment for the development of snow mold, particularly if snow cover is established before there is frost in the ground. Because screens and covers also provide an ideal environment for the development of snow mold, all areas that are to be covered should be treated before the covers are put in place.

Generally in the Northeast, moisture from natural sources is adequate in the fall for the development of a healthy turf. However, during the early spring after a dry, open winter there



Sod cutter with mole attachment is used to install heating cables.

may often exist a need for supplemental water. The turf can be severely desiccated when subjected to drying winds without a snow cover. Moisture is constantly lost from exposed tissue and little if any moisture is being replaced by the root system. Moisture applied under these conditions will help to reduce or eliminate injury from desiccation.

Artificial Protection

When we talk of artificial protection, we are referring to that portion of ecology known as micro-climate. Micro-climate is the environmental condition which exists in close proximity to the turfgrass plants. By controlling moisture loss, restricting low temperature and buffering against any rapid temperature fluctuations, we can minimize or eliminate the damaging effects of winter weather. At our disposal we have tools such as anti-desiccants, protective screens and covers, and electric heating cables.

Although anti-desiccants have been used effectively on horticultural plantings, recent results have shown them to be ineffective in reducing moisture loss from turf during the winter.

Over the past eight or ten years, many different types of screens and covers have been tried



Plastic screening can be unrolled and spread over the green in a short time.

in the various sections of the country—at universities, by industry and on golf courses. Generally they have been a topic of mixed emotions. During difficult winters, all covers reduced or eliminate winter injury. During normal seasons the covered areas greened up two or three weeks earlier in the spring, but there was no difference between protected and non-protected areas by the time they were put into play.

The response of turf to the different materials was wide and varied. Factors such as the color of the materials and the amount of air exchange attribute to the varying results. Prior to the selection of a material, it might be advisable to check recently published results on the subject.

The critical factor associated with the use of protective coverings seems to be associated with the timing of their removal in the spring. The grass should not be allowed to grow too

high, because it will require considerable time to get it back down to the desired height of cut without scalping. The second factor is that after the turf's uncovered, a sudden change to cold weather can injure the soft turf.

Heating cables provide another source of winter protection. They have been used alone and in conjunction with protective coverings. Heating cables have been used on athletic fields and their use on golf courses might be economically feasible on limited areas, such as practice greens, principally as a means of prolonging outdoor activity. However, it is extremely doubtful if this method will be used on golf courses to any extent because of the high cost of installation and operation.

In summary the best protection against winter injury is a sound management program supplemented by good drainage and sound judgment.

GREEN SECTION STAFF CHANGES

At the New York Meeting on Golf Course Management, Henry H. Russell, USGA Green Section Committee Chairman, announced the appointment of Lee Record as Mid-Continent Director of the USGA Green Section. Record joined the Green Section Staff in 1962 and has had extensive experience in the Eastern and Mid-Continent areas. He is a graduate of Colorado State University and had earlier experience

as a golf course superintendent.

Dr. Paul Alexander announced his resignation from the staff effective January 1, 1970. Formerly an Associate Professor of Agronomy at Clemson University, he came to the Green Section on July 1, 1969. He now leaves to take up the new duties of Education Director for the Golf Course Superintendents Association of America.