

# WINTER PLAY ON GOLF GREENS

by C. R. SKOGLEY

GOLF course superintendents employed in those parts of the continent that are subject to cold winters share one major concern—winter injury to turf grass. O. J. Noer stated this fact clearly when he wrote: "When grass survives the rigours of winter, summer is no problem in the far north. In this region, winter and early spring are the critical seasons for turf grasses."

Many articles have appeared in golf journals over the years on the subject of winter injury. The concern over the problem is certainly nothing new. In recent years, however, there has been an increased awareness both of the problem and of the exact causes of it. There has been a real effort to learn how to prevent this seasonal headache. Much of this recent interest has been spurred by two extremely bad winters. The winter of 1958-59 caused more turf injury in the north-east than had been recorded for at least 35 years. The winter of 1962-63 was nearly as bad.

Winter injury is very complex. Injury to the grass takes many forms and is caused in several different ways. Soils, too, may be damaged as a result of winter weather.

In a recent article on the nature and prevention of winter injury, J. R. Watson, Jun, indicated that winter injury, occurring in northern climates, falls into two rather general categories—mechanical and physiological damage. Mechanical damage, except for frost heaving, he indicated, was caused by man and damages turf directly or indirectly.

"Direct injury," he wrote, "is produced by traffic when the grass is covered by frost or when it is dormant or semi-dormant and the soil is partially or completely frozen." Watson categorised direct injury as "(a) bruising (cellular rupture) resulting from traffic on frosted grass" (usually occurring in late autumn and early spring); and "(b) attrition from traffic on partially or completely frozen soil especially when grass is near or at dormancy".

Watson suggested that mechanical damage to soil produced by traffic on partially frozen or wet soils causes indirect turf grass injury. The *visible* evidence of this type of injury is actual soil displacement—footprints, ruts or similar surface disfigurement. Indirect injury may also be of an *invisible* kind—soil compaction. Chances for this type of injury are greatest on wet soils and during periods of grass dormancy since there is less mat or cushion present.

The physiological damage referred to by Watson is what is most frequently referred to as "winterkill". This is the injury resulting from disease, scald, suffocation, desiccation and related causes.

Mechanical injury to greens during the winter seldom gets adequate attention. Most of the efforts to avoid winter injury, and most of the current research on winter injury, relate to physiological injury. Perhaps this is proper since physiological injury is more complex and cannot be as quickly eliminated as mechanical injury. Mechanical injury (except for heaving) generally can be avoided by eliminating traffic during periods of adverse weather or when soil conditions are poor.

A report by A. M. Radko following the hard winter of 1958-1959 indicates certain damage from mechanical injury resulting from traffic. He wrote: "Traffic injury from winter play was also pronounced. The winter being an open season, more winter play was a factor. Turf around cup placements and walk-off areas is sparse at this writing." This would refer to *visible* direct mechanical injury. On many golf courses in northern areas where winter play is regular, similar or worse injury is encountered each spring. The indirect and invisible mechanical injury although not obvious may well be the most serious result of winter play.

The effect of frost action and compaction on wet soils has received

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considerable study. The action of frost on soils can be favourable or unfavourable depending on the soil texture, organic matter content, moisture content, the rate of freezing, frequency of thaws and depth of freezing. Buckman and Brady have indicated that the force developed by the freezing of water is an almost irresistible force equivalent to about 150 tons of pressure to the square foot. That soil moisture content, then, is important in considering frost effects on soils is easily understood.

It is generally considered that frost action is beneficial. It is believed that alternate freezing and thawing causes a granulating effect on soils and may help overcome compaction caused during the regular playing season. Baver states that freezing and thawing do not always result in improved soil conditions, however. If the soil is dry during the winter there will be little change in aggregation, and, if it is excessively wet there may actually be a dispersion of aggregated materials.

It is usually possible, and certainly desirable, to make sure that greens do not go into the winter in a dry state. It is not possible, generally, to regulate soil moisture in late winter, however, when the frost starts to leave the soil. Since thawing commences at the soil surface any excess water is trapped at the surface by frozen soils below. It is customary to have periods in late winter or early spring when the surface soil is saturated. It is during this period that traffic damage to the soil is most likely and most lasting.

Traffic on these "fluid" soils not only causes visible injury but actual puddling can occur with a subsequent loss of aeration and drainage. It is difficult to maintain adequate soil aeration and surface drainage under heavy play on golf greens when play is confined to the growing season. When traffic is permitted on soils that are waterlogged as a result of frost action, all benefits of a good greens management programme may be overcome rapidly. Certainly the benefits occurring

as a result of alternate freezing and thawing will be lost.

*Winter play on golf greens is most likely to cause injury in late autumn or early winter and again in early spring.* The injury caused by this play is primarily mechanical—*bruising* resulting from play on frosted turf when the grass is not completely dormant, or *attrition*, actual wearing out of the grass at a time that it cannot be renewed. A second type of injury is to the soil. This is most serious during the time the soil is thawing and shortly thereafter.

There are several ways to lessen damage from winter play. The most obvious is to provide small temporary "greens" near the regular green for winter play. Since the surface of a green seldom provides a good putting surface under frozen conditions and golfers are generally more interested in exercise than in score at this season, the temporary "greens" are generally acceptable. *Some superintendents provide extra large cups in the winter "greens" to help compensate for poor winter putting conditions.*

Another method used to reduce injury in late autumn is to water the greens lightly in the mornings to remove the frost from the grass before permitting play. Many courses close for play on the days the superintendent feels the injury potential is high.

It is well to keep the membership informed of the damage potential from winter play. If winter play is regular, an additional budget item should be requested as some repair work will be necessary with the arrival of spring.

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