

ICE-SHEET DAMAGE

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This article deals with a subject little known in this Country until last winter. It is of interest that its conclusions match those of several greenkeepers over here who suffered severely in the early months of 1963. If the "killer" returns, we may have to devise routine measures annually.

But don't let it spoil the Christmas festivities. It may not be so bad this time.

CONSIDERING that the Midwest and East were hard hit by ice-sheet damage in 1961-62, and that New England had the unwelcome visitor back again last year, there is a very strong possibility that many areas in the northern part of the country are going to have to put up with the phenomena once more in the cold months of 1963-64.

So, at this moment, the big question in the minds of practically every superintendent north of the Mason and Dixon line probably is: "Is there anything that we can do to guard against ice-sheet damage or, at least, minimise its injurious effects?"

Superintendents who have gone through the ice-sheet ordeal think they know the cause, some possible ways of preventing it and, since they had to renovate their courses after it heavily damaged them, the remedy for it. Yet they are not 100 per cent sure they know all the answers that there are to be known about winterkill.

Heavy Rainfall Started It

In reconstructing the events that led up to our troubles in the Midwest in 1961-62, we had abnormally heavy rainfall in August and September of the former year. It amounted to something like 30 inches, enough almost for the entire 12 months. October and November also were excessively rainy, with the result that the soil became super saturated. This left the grass roots in a shallow, unhealthy state.

We might have survived the rain, but in early December a severe ice storm struck the Midwest. It was followed by heavy snowfall within a few days and for the next three and one-half months

most of our courses were covered by ice and snow.

Warm Weather May Have Hurt

Soon after the ice and snow storms hit us, we sensed that we were in for great trouble. But there was nothing much that could be done because most courses, especially those around the Lakes, were literally snowbound. Late in the winter we had a few days of unseasonably warm weather, which turned out to be a blessing for some, but as far as I am concerned, the worst thing that could have happened to us. Some superintendents, including Ray Gerber of Glen Oak, were able to remove the ice from their greens during the warm spell and their courses suffered very little damage. But most of us weren't so fortunate, finding it impossible to get to the greens to work on them. Even if we had, desiccation may have caused more damage than the ice sheets did.

Those few days of warm weather, in my estimation, could have been the cause of most of our trouble, although I will concede this is a matter of conjecture. A good deal of sunshine passed through the ice during this period and was absorbed by the grass. The heat partly melted the ice on the leaves but the plants remained encased in ice. This possibly resulted in sufficient leaching to kill many of the grass plants.

Greens Almost Black

Late in March, when the ice and snow finally thawed, most of us found we were in serious trouble. Many greens were

sadly discoloured, some of them being almost black. In addition, the odour that emanated from them was nauseating. This may have been due to one or two conditions: Carbon dioxide, produced in the root area, couldn't escape because of the ice sheet; or the absence of oxygen caused an anaerobic condition in which alcohol instead of sugars and starches was manufactured. It was noted that the thatch actually fermented.

The superintendents in the Midwest area hastily got together to go over the maintenance ground rules and see if anyone had any lucid ideas for lifting us out of our dilemma. Certain maintenance procedures were suspected of having caused some of our trouble. Fertilisation, irrigation, treatment for snowmold, aeration, the use of chemicals, etc., were thoroughly discussed in an effort to find some clues.

The use of corn gluten meal as a winter fertiliser was at first denounced, but we learned that courses that didn't apply this product were just as severely damaged as those that did. Next, aeration, or lack of it, was blamed. Then, late fall mowing and some of our ideas about irrigation came under suspicion. We finally decided we couldn't finger any of these things as being the culprit because the results of too many of our maintenance practices contradicted others. For example, at one 36-hole course in the Chicago area, 18 greens had gone out but the other 18 were in good shape. Maintenance on both courses had been identical.

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If compacted turf is overlaid by a thick sheet of ice, life-giving oxygen can't penetrate to the roots. . . Air drainage is a must.

Is This The Answer?

Eventually, soil structure was discussed. A quick survey showed that most severely damaged greens were ones in which the soil was heavily compacted. At one course, where thick layers of peat and sand were evident in the green structure, excessive damage was suffered. There could be only one conclusion: If compacted turf is overlaid by a thick sheet of ice, it doesn't have a chance. There is no way in which life-giving oxygen can reach the roots. Air drainage is a must!

One rather curious observation was made by several Midwest superintendents. Immediately after the thaw, the turf looked perfectly normal for late March. But, within a few days, it had turned a sickening straw colour and, at a few courses, even black. This led us to believe the grass may have been damaged by still another cause—ice crystal formation on the lower tissue and root.

Superintendents in our area now generally agree that certain bents are a good deal more tolerant to ice-sheet damage than others. Toronto and C-15 and Penncross, for example, came through the winter of 1961-62 in much better shape than Seaside. At our course, much of our old bentgrass thinned out and, in some cases, disappeared. Seaside greens along with the poa anua took a terrific beating.

Bringing our greens back in the spring of 1962 wasn't an easy job, but by early June they were in reasonably good shape again. We employed a two-step programme in restoring the putting surfaces: First, we aerified the dead areas and then used a verticut machine to break up the plugs. Then we seeded with Seaside at the rate of 5 lbs. per 1,000 sq. ft. The seed was worked into the soil and kept moist until germination.

As a second step, we seeded first and then aerified. This meant that the seed actually was buried by the soil which was extracted. We feel that the seed was well anchored by planting it this way and that germination time was reduced. In both operations, damping off was something of a problem and could have resulted in a bad disease condition. But we applied fungicides quite liberally and kept it minimised.

How New England Fared

The story of how the Country Club of Brookline was shaken by winterkill in 1962-63 is well known because it was widely publicised due to the playing of this year's U.S.G.A. Open. Most other superintendents in New England had just as many problems with ice-sheet damage as John Kealty, the C.C. of Brookline greenmaster. . . Last winter, Penobscot Valley in Bangor, Me., recorded 175 inches of snow and then got an additional 20 in April to plague Superintendent Charles Emery. . . Pete Ruby of Portland G.C. and Walter Swasey of the Riverside munny course, also in Portland, were ploughing snow off the greens in early April. . . They had treated for snowmold the previous fall and escaped serious trouble. . . When the ice broke up in the spring, they applied Milorganite at 50 to 100 lbs. per 1,000 square feet and their greens quickly came around. . . Tony De Rocco of Oakland C.C. in Runford, Me., made his final fall cut at $\frac{3}{4}$ inches and escaped with little damage.

This article is condensed from a speech made by Ted Woehrlé at the G.C.S.A. convention last February.

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