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The editors are always glad to receive notes of interest for publication in "The Bulletin." Contributions from greenkeepers and greencommitteemen are always welcomed.

Standards in Course Architecture

A prominent golf architect recently embodied some charming sentiment and excellent advice in a letter to a friend. His words are as follows:

"I rarely hear any criticism from the average class of players about courses being too hard; they are not, generally. We have a few which offer a supreme test, but that is quite proper. We must have a standard in golf as we have in music. How often we hear people say that the finest operas are beyond them, but they all want to go; they are the standard of music and never grow tiresome or common. So it is with golf and other things. And it is undoubtedly true that the courses offering the best and fairest test of golf, other things being equal, are the most popular. The only thing which ought to be shunned on any golf course is having it too hilly. Bunkers and hazards mean nothing to the average players, but they all rightly despise hill climbing and rough sections where balls are apt to be lost."

Winterkilling of Turf

By LYMAN CARRIER

This is the season of the year when many of the northern greenkeepers are confronted with the matter of preparing their greens for winter. On some of the northern courses putting greens come through the winter in bad condition. Often much of the grass is dead, necessitating reseeding. The writer visited the Minneapolis-St. Paul district early last spring for the purpose of studying the subject of winterkilling of turf. In previous seasons New York and New England courses have been visited. One thing seems to be clear: bluegrass, the bents, and fescue are not killed by cold weather anywhere in this country if the soil conditions are right for their growth.

As previously stated in THE BULLETIN,* most of the winterkilling is due to faulty drainage. This was clearly evident on a number of the greens studied. In a few cases the killing was confined to depressions in the surface from which the water could not escape so long as the soil beneath was frozen. A great many of the greens that have winterkilling are built in side hills and the greens are water-logged with seepage from below. No protective measure will save the turf on poorly drained greens except drainage. In some cases this means a relocation or rebuilding of the green.

There was some winterkilling in the Twin City district which could not be charged to faulty drainage. Some greens had dead spots, definite in outline, indicating that weak plants had succumbed. Often adjoining these dead areas were perfectly healthy patches of velvet, creeping, and Rhode Island bents. It is not easy to identify the species of grass which make up dead turf on a putting green. There were sufficient remains, however, to show that the dead grass was mostly of the *Agrostis* genus,

*THE BULLETIN, 1922 Volume, pages 84 and 162.

which includes redtop and the bents. The writer is indebted to Mr. Tom Vardon, the professional and greenkeeper at the course of the White Bear Yacht Club, near St. Paul, for an explanation of the trouble. Mr. Vardon's observations lead him to the conclusion that the winterkilling is confined mostly to the redtop which has been customarily seeded in the greens every spring. One thing is evident, that if the greens were all covered with the hardy strains of bent which are growing on some of them, there would be no winterkilling under ordinary winter conditions.

On several courses during the past two or three winters the greens have been covered with a layer of brush, which is covered with straw. The evidence is not very conclusive either for or against the practice. Some who covered their greens last year say they will not do so again; others contemplate trying the method further. It is the writer's judgment that the most effective remedies for winterkilling are (1) drainage if needed and (2) creeping bent turf.

How We Tile-Drained at the Columbus Country Club

By WENDELL P. MILLER*

Tile drainage work on established golf courses is usually done during the early spring. This is not because spring is the best time in the year to install tile, but for the reason that the need of any additional drainage is most apparent at that time.

Several reasons why tile drainage work should be done in the late fall rather than early in the spring have come to my attention. In the fall the greenkeeper's work gradually slacks off as the grass quits growing and the amount of play dwindles. This makes an easy solution of the labor problems. The ground is firm enough, so that the tile can be distributed from wagons or trucks without marring the fairways. The fall rains and frost will do more to bring a tile drain into full action than any other single force. Thus late fall drainage will be giving almost full service when it is needed the following spring, enabling the greenkeeper to do many spring jobs on time. Drainage that is installed in the spring is usually mudded in. This means that it will take the frost of two or three winters to undue the damage done in handling the soil from the trench while wet and sticky. With these few reasons for doing drainage work on golf courses in the fall rather than in the spring, I want to tell you about the tile drainage that was installed last fall at Walnut Cliffs, the course of the Columbus Country Club, in Ohio.

The first nine holes were laid out in 1898. From 1898 to the fall of 1921 the course had been growing under the direction of both amateur and professional golf architects and turf experts, without any set policy or well defined program of extension and maintenance. Like nearly every other club did in the "good old days," they had purchased seed, fertilizer, "humus," worm eradicator, etc., in liberal quantities which drained the treasury but not the fairways. From year to year tile drains were installed, but since there was no plan and no record was kept, each succeeding greenkeeper simply added to the tangled network of drainage.

In 1921 the condition of the course convinced the green committee that

* Prof. Miller, of the Agricultural Engineering Department, Ohio State University, Columbus, in addition to his regular college duties has taken a keen interest in golf turf problems, and particularly the engineering features involved. He has assumed the responsibility of turf maintenance on three golf courses, and writes us that during the past ten months has designed and supervised the installation of 360,000 feet of tile on golf courses. We are glad to get this contribution from him describing the tile drainage work at the Columbus Country Club.—Editors.