

after a severe winter. I do not see how this ice could injure the roots of the grass while the ground is frozen solidly, and believe that the damage is done in the spring when the grass roots are coming to life and the ice would not normally remain. Perhaps a better term would be *spring-killing*. Whether the damage results from a smothering effect at a time when the ground is opening up and the roots require air, or whether it is a rotting effect from the continual wetting from the melting ice with frequent refreezing at night, or perhaps a combination of this action with a lack of air, I do not know, but I believe that this is the time when the harm is done. It would be interesting to try the experiment of breaking up and removing these patches of ice as soon as the ground began to thaw out in the spring. So far as I know, this experiment has not been tried around here, and this does not look like a very promising year to test it.

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The winter-killing of grasses is not considered a serious matter here in New England, as far as my observation and experience goes. Of course, we have some winter-killing of grass in meadows, pastures, and lawns where the water tends to stand for some days during the early spring. The cause of the winter-killing in such cases I have always attributed to the water-logged condition of the soil, which results in actually drowning the plants through the lack of sufficient air. Alfalfa very frequently winter-kills, but mainly as a result of the heaving up of the plants and the tearing off of the roots on soils with any considerable amount of clay in them. Timothy is also subject to winter-killing, particularly when the field has been mowed or pastured late in the season and not sufficient substance has been stored in the bulbs to withstand the rigors of continued low temperatures with the absence of a snow covering. Our clovers also frequently winter-kill, and this I have usually attributed to the alternate freezing and thawing which we have in the early spring after the snow has left.

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Early Spring Work on a Golf Course

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This has been an unusually bad winter for anything more than the winter work at the barns such as detailed in the article in the February 23, 1921, number of THE BULLETIN (pages 16 and 17). It is therefore assumed that the green-keeper is prepared, ready, and waiting for the opportunity to go to work on the course.

FAIRWAYS

As soon as the snow has disappeared and the frost is out of the ground, when yet too wet to do anything to the fairways and putting-greens, it would be well to inspect the wet places about the course to see whether the drains are sufficient, and put in others where necessary. All such places show up more clearly in the spring than at any other time, and the evidence of needed lateral branches is more apparent. It may also be found that banks of the streams, bunkers, and water hazards are broken down by the frost. These should be protected to prevent further disintegration, and made more sightly.

Perhaps, after all these things have been done, the fairways may be dry enough to roll. Of this, however, one should be certain, as there is nothing that can be done that will be more injurious to the development of turf than heavy rolling when the ground is very wet. The only com-

To correct a typographical error in the March BULLETIN, cut this line out and paste it over the seventh line in the second paragraph on page 88:

greens, the entrance or approach is called south, the back (which is usually

To correct an error in the March BULLETIN, cut this numeral out and paste it over the numeral 6,348,000 in the last line on page 90:

plete remedy for such an error is another winter's upheaval. I realize that there are many advocates of only light rolling at all times. I am strongly convinced, on the other hand, that heavy rolling after the winter's upheaval is not only beneficial but necessary to make dense, vigorous turf. I am sure that since the introduction of the triplex form of mowers, fairways generally are not rolled enough. The clay fairways of the Columbia Country Club are rolled twice every spring with an old-style gasoline mowing machine that weighs 2,800 pounds. Under this treatment they have developed until today for beauty, quality, and perfection we invite the closest inspection or criticism.

PUTTING-GREENS

What has been said about rolling the fairways holds equally well for the greens, only the roller should weigh not less than 1,200 nor more than 1,600 pounds, and drawn by man-power. Under no circumstances should a power mower be used on the greens, as the dragging and turning necessary in operation disturbs the even surface, often leaving ridges and depressions hard to remedy. In designating the points of the compass of greens look sickly, as sooner or later they will respond to the warmth of (higher) north, and east and west accordingly. Commencing at the north, rolling east and west successively, the line left by the roller is pressed out, due to the slant of the green, leaving a perfectly even surface. The green should then be raked or brushed vigorously in one direction only, and cut, using the grass catcher. After that it should be raked or brushed in the opposite direction, and cut again. This should be repeated, always in another direction, until all the long blades that have formed during the winter have been cut off. At each successive cutting use a machine set a trifle lower until you get down as close as the greens are ever cut at any time of the year, so as to make the crowning, so to speak, early, when the grass shoots will have a better opportunity to respond in the warm, moist days of each spring, and form a closer, denser mat before summer or very hot weather. Do not be discouraged if for a week or two the greens look sickly, as sooner or later they will respond to the warmth of the sun. The greens should be seeded now, if necessary, as the ground, from the raking or brushing, is open to receive the seed. Top-dress heavily with a suitable compost of two parts of finely-screened mushroom soil, two parts of wood earth, and one of sand, all of which was prepared in the early winter and kept dry in the barn. Apply from one to two yards, according to the size of the green. Afterwards brush and drag thoroughly until the dressing is well dissipated. Finally roll with a 250-pound roller. If followed by dry, windy weather, the surface should be kept moist by spraying, using a large rose-nozzle to prevent disturbing the new seed that is added with the compost. Do not cut the greens when wet, nor use the grass catcher for a week or more afterwards when cutting. If the turf is at all weak, the green should not be played upon for a week or more.

Everybody is now demanding low-priced golf in reach of the average fellow, and if a little good intelligence is used the thing is possible. The rich man must forego some of his golf habits. No more of this ten-dollar-a-hole stuff! To reach economy we all must practice economy.