

adversely than it does Kentucky bluegrass, redtop, or the bents; therefore it can not be used successfully on courses as far south as Washington, D. C. Brown-patch also seems to attack it more severely than it does the bents. Kentucky bluegrass, it will be remembered, is practically immune to this disease.

Everything considered, red fescue is decidedly second to Kentucky bluegrass as a fairway grass and to the bents on the putting greens. The cases where it is superior to these grasses are very few indeed. It is by no means uncommon for the bents to crowd out red fescue on the greens and for Kentucky bluegrass to overrun it on the fairways; but no cases have been noted where red fescue has replaced either the bents or Kentucky bluegrass.

The germinability of red fescue seed is not very dependable. The seed loses its vitality quickly. It does not remain viable as long in storage as does seed of the bluegrasses, bents, or redtop. Every lot, therefore, should be tested before it is sown. Most of the seed that is on the market is relatively free from other seeds and inert matter; this is particularly true of seed of Chewings' fescue.

SHEEP'S FESCUE

As a grass for the rough on northern golf courses, sheep's fescue is nearly ideal, especially if it is grown upon poor soil. It forms just about the right kind of bunches to afford the proper penalty to the player. It is also useful on bunkers to produce what is commonly called "whiskers." On most of the older courses in the North there is more or less sheep's fescue on the fairways and some even on the greens. Many of the fairway and putting green mixtures formerly used contain seed of it. It should never be sown on either fairway or green, as it is not a turf-forming species. The use of sheep's fescue should be confined strictly to the rough and bunkers. For the rough it should be sown at the rate of about 50 to 70 pounds to the acre. Seed of Canada bluegrass can be sown with it to advantage. The commercial seed of sheep's fescue is difficult to distinguish from that of red fescue.

Changing the Cup

LYMAN CARRIER

The question was asked us recently why the plugs of turf transplanted in changing the cup on putting greens often die. We have noticed these dead and brown spots of turf on the greens of several golf courses marking the previous locations of the cup, and wondered why, as we often use a hole cutter to patch bare spots, or replace weeds with turf without having any trouble from the plugs dying.

An experiment was started to try everything we could imagine a greenkeeper might do in changing the location of a cup. Plugs were taken to the full depth of the hole cutter. With some all of the soil was knocked loose, leaving just the turf about three-fourths of an inch in thickness. The loose soil was then put back in the hole, tamped slightly, more soil added to bring it to the proper height, and lastly the piece of turf was put



Figure 1—Removing the cup from the old hole

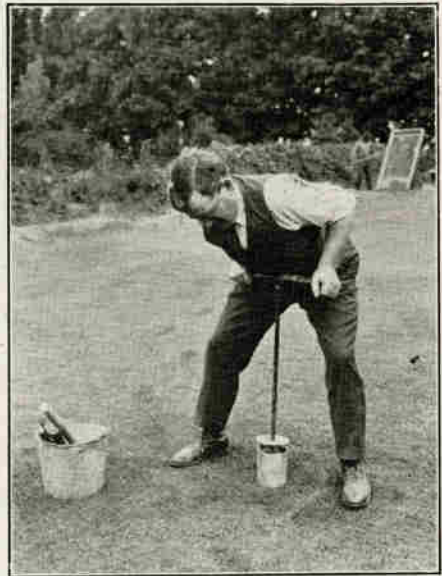


Figure 2—Cutting the new hole



Figure 3—Putting the sod or the bottom soil into the pail



Figure 4—Tamping soil into the old hole

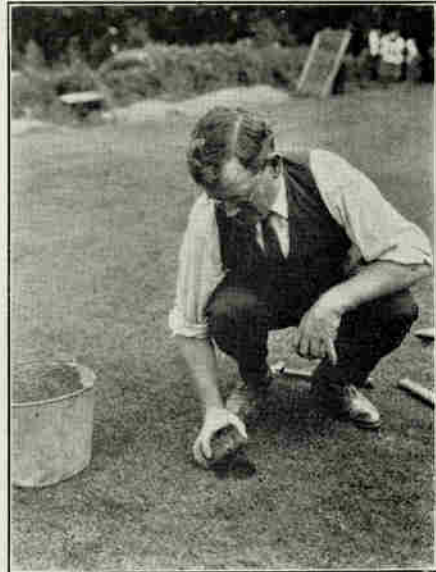


Figure 5—Putting sod plug in place

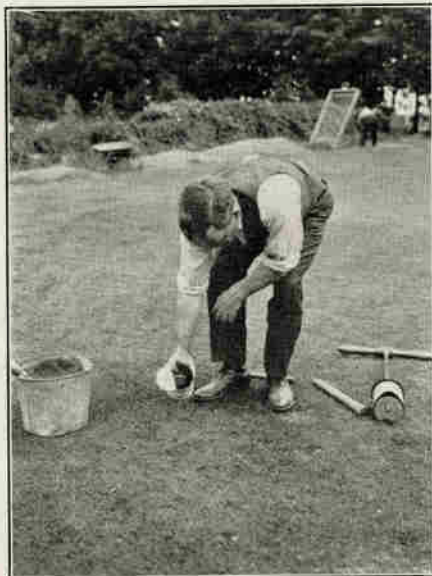


Figure 6—Watering the plug. Note the neatness of the finished job

in place. Then plugs were taken out and put right back. Others were taken out and the holes allowed to dry for three days, and were then filled with fresh plugs. Water was used in some cases in the holes, and in others on top after the plugs had been put in place. Some were not watered at all. To sum up the experiment: all of the plugs lived except the ones we left out on top of the ground for three days to dry, and even they were not entirely killed. From the standpoint of what we were trying to find out the experiment was a failure. But having the grass live is only one feature in the matter of the proper changing of cups. The plug of grass should be so replaced that it will be even with the surrounding turf. It should be impossible to find the old cup marks after the plugs have had a few days to grow.

Every greenkeeper knows that the soil removed with a hole cutter will not completely fill the hole if it is stamped in place when putting it back. There is food for thought in this fact, which we recommend to the attention of the advocates of subsurface "ventilation." In order to avoid having a depression of from one-half to an inch in depth, it is necessary to have some extra soil handy to fill the hole to the proper height. Of course it is just as bad to put in too much soil, thereby making a mound, as it is to leave a hollow.

The writer was recently on the Seaview course, where the practice is to change the cups three times a week. This operation had been so skillfully performed that it was impossible to find any of the previous locations of the cup that were more than a week old, except where grass of a different texture than the adjoining turf had been transplanted.

It is thought that an illustrated article showing the successive steps in changing a cup as practiced by an experienced greenkeeper might be valuable. Mr. William Connellan, of Friendship, Washington, D. C., kindly consented to stage a demonstration before the camera. It is not intended to convey the idea that this is the only method which can be followed. There are other greenkeepers who get satisfactory results and who do the work differently. This article was not prepared for them, and we will not be offended if they do not adopt the following suggestions:

EQUIPMENT

Mr. Connellan recommends the following outfit, which the man carries with him as he goes about the course to change the cups: (1) hole cutter, (2) hook for removing the cup, (3) a two-gallon pail half full of good natural topsoil, (4) a hammer or mallet, (5) a stout piece of wood about eighteen inches long and two inches thick (a piece of a pick handle will answer), (6) a quart-cup or tin can to carry water. (See illustrations.)

PROCEDURE

The successive steps in the operation are given in their proper order, as there is often much lost motion and consequently more time consumed than is necessary to do this work correctly.

1. Remove the cup from the old hole. Figure 1.
2. Take the hole cutter and pail of soil and go to the new location. Cut the plug of turf about two inches thick. Be sure to turn the cutter without wobbling. Rest the body on the handle if necessary to hold it

steady. Put this piece of turf in the pail, being careful not to injure it in any way. Figure 2.

3. With the hole cutter remove the rest of the soil to proper depth, and empty this into the pail. Figure 3.

4. Put the cup in the new hole and drive it down solid with the top of the cup at least $1\frac{1}{2}$ inches below the surface.

5. Fill the hole with the soil from the new one, using the piece of wood and mallet to tamp it down firmly. Add more soil, and tamp it until the hole is filled to within the thickness of the plug of turf from the top. Figure 4.

6. Put the plug of turf in the hole and press it firmly in place with the foot. If the top of this plug is not perfectly even with the adjoining turf remove it and add more soil, or remove the surplus, as the case may be. Figure 5.

7. Pour about a quart of water on the plug. This watering should always be done last and not put in the hole before it is filled and tamped. Figure 6.

Success With the Fertilizer Distributor

Under date of July 27, 1922, Mr. Harry F. Collis, of the Flossmoor Country Club, Flossmoor, Illinois, submits the following contribution:

"I thought the readers of the BULLETIN would be interested in a new way of applying sulphate of ammonia and other liquid fertilizers. At Flossmoor I used to employ three men when I gave the greens an application of sulphate of ammonia, two men being used to operate the pumping of the liquid from a fifty-gallon barrel, and one man spraying the green. The cost for spraying the eighteen greens was about \$35.00. Now I give the greens a thorough sprinkling once a week, without entailing any extra cost for labor. I have three fertilizer distributors, which are attached to the hydrant, and also the sprinkler. The water coming from the hydrant is run through the distributor, and the sulphate of ammonia is put on the green through the sprinklers. In this way three greens are sprayed in a night. We have to change our sprinklers four times to cover the green, and the man who does the sprinkling puts five pounds of sulphate of ammonia in the distributor every time he changes his sprinklers. This is the ideal way of applying any liquid fertilizer, as it gives an even distribution and is washed down to the roots of the grass."

Some Principles of Golf Architecture; Being the Opinions of Divers Amateurs

No two golf courses are alike. There is room for infinite variety. To some degree the extent of the variety is limited by the tendency to standardization in the modern so-called championship course of 18 holes. No matter how simple or how complex the construction may be, the players derive plenty of wholesome sport from playing any course. Even though this may be true, the evolution of the game and the opinions of the players point to some features of golf course construction as most desirable and to others as having little merit. Golf architecture will improve more