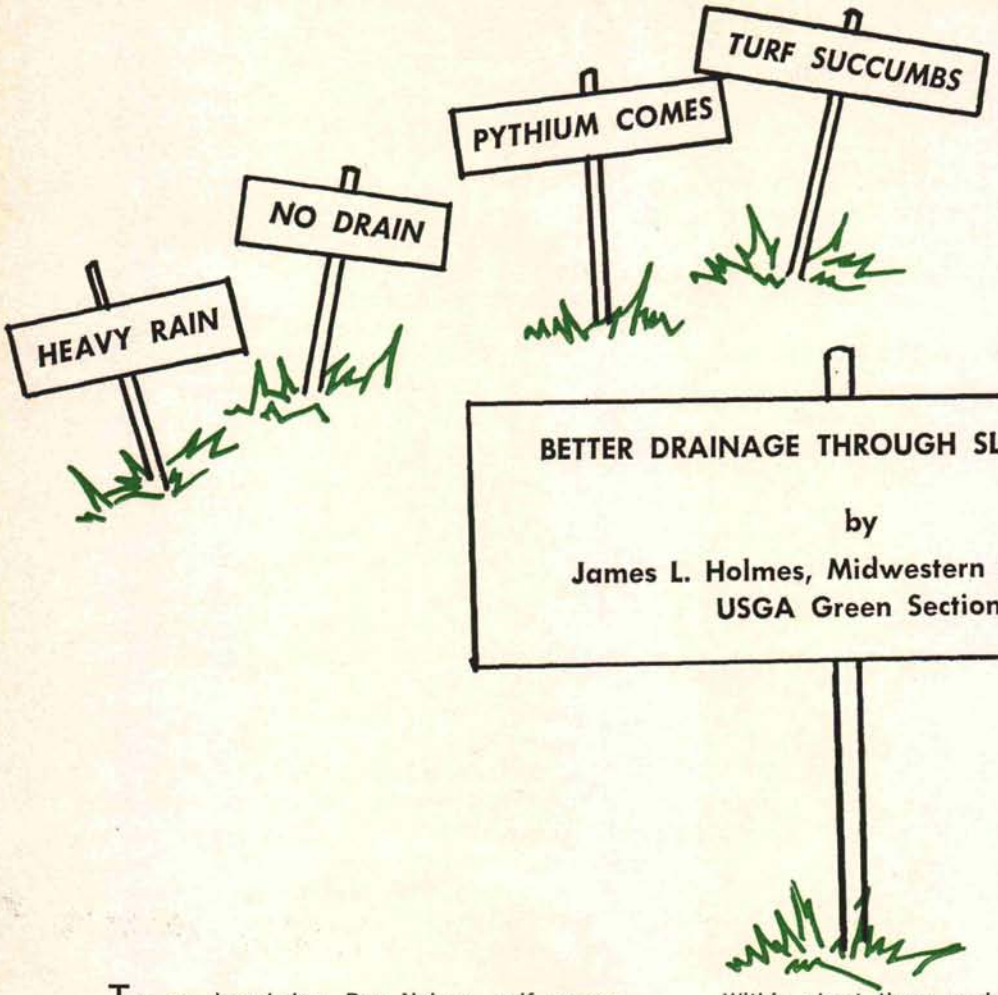

BETTER DRAINAGE THROUGH SLIT TRENCHES

by

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To my knowledge, Roy Nelson, golf course superintendent of the Ravisloe Country Club in Homewood, Ill., was the first man to develop the open slit trench method of surface drainage. About eight years ago Roy and his crew were digging slit trenches in low, water-holding areas which they planned to fill with pea gravel to within four inches of the soil level, and then fill the remainder with soil and place sod. After the trench had been dug and pea gravel installed, a hard shower developed, and the crew sought shelter in the maintenance shop.

Upon returning after the rain, Roy noticed that the partially gravel-filled slit trenches had immediately received the water and the low, water-holding area where the trenches were being placed was completely drained. As a result, Roy decided to fill the trenches completely to the surface of the soil with pea gravel and observe if turf would grow over the pea gravel.

Within about three weeks, turf had grown over the gravel slit trenches and they continued to accept surplus surface water readily, thus facilitating surface drainage.

Now, eight years later, these trenches have not "dirtied-up," and they continue to accept surplus surface water readily. However, such trenches cannot be dug in bare or non-turfed soil because they will seal from soil movement or erosion effects. Roy estimates that at present he has in excess of 20 miles of slit trenches at Ravisloe, and has effected rapid and adequate surface drainage. Prior to this time, it had been simply impossible to "surface drain" the terrain at Ravisloe, and each year large areas of fairways were lost as a result of standing or puddled water. This was true even though a complete herringbone subterranean tile system had been installed and was in place for a number of years.

Since this time, practically every golf

course I have visited has installed open gravel slit trenches.

The reason for leaving the gravel-filled slit trenches open to the surface of the soil is really quite simple. The principle involved here has been recognized for a number of years. If any amount of soil is placed over gravel, not only do the smaller soil particles fill or seal the interstices of the gravel, but they also act as a blotter or sponge above the gravel, and quite effectively keep water from entering as rapidly as necessary.

To date all such trenches have been dug to a depth of approximately three feet and three inches wide. This is so because equipment for digging such trenches is designed this way. It is possible that a slit trench one inch wide would be effective.

If slit trenches can be placed over tile or extended into a natural drain-off, so much the better. However, this is not absolutely essential because slit trenches running through low, water-holding areas, and without an outlet are still effective in encouraging rapid surface drainage. This is no doubt due to considerable water being absorbed through the bottom and sides of the trench.

Even though subterranean tile is in place, water movement down through soils high in silt or clay content is impeded, and such tile cannot remove surface water fast enough to guard against turf "cook-out" during stress periods. The simple installation of gravel-filled slit trenches has circumvented, or negated the necessity of placing tile in many locations. Obviously, if a large, low, water-holding area is in question, it is helpful, perhaps even necessary, to place at least one tile through the area for complete carry-off. When this is done, herringbone pattern slit trenches can be run from this tile into low pockets or water-holding spots.

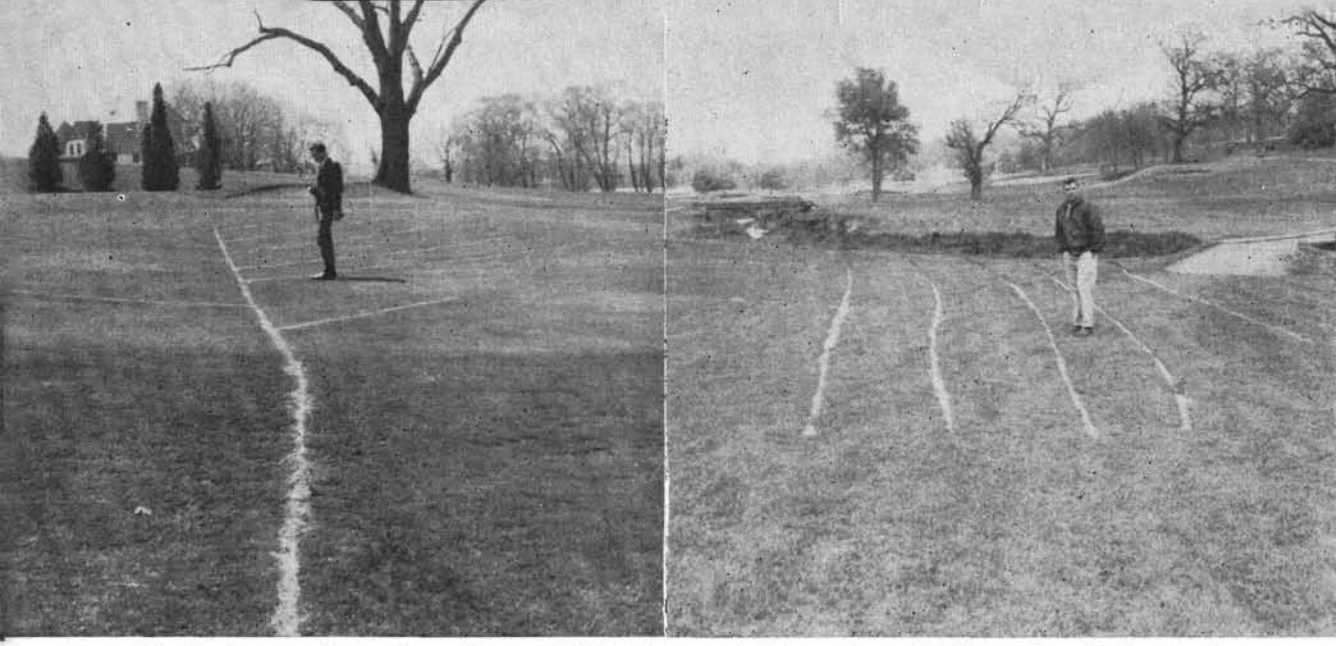
We have found that pea size is the most effective type gravel. It tends to stay in the trenches better. Further, in locations adjacent to greens or other "landing" areas, many superintendents place four or five inches of a calcined clay material over the gravel. This prevents club faces from being damaged. The turf grows over or covers calcined clay somewhat more rapidly than it does gravel.

As the years pass, we have found that more superintendents are depending on slit trenches to insure a rapid surface drainage. Indeed, at many courses it was impossible to maintain a healthy turf on certain fairway locations during July and August. As an example, the picture of Al Bunn standing in the low fairway area where slit gravel trenches run off into the creek has made it possible to maintain a suitable turf here.

Prior to slit trenching, the grass constantly had "wet feet." Of particular interest, this area had been completely herringbone tiled for a number of years, the tile emptying into the drainage ditch. Even so, it was impossible to keep a healthy turf in July and August following heavy summer rains. This is just one of the many examples in the Midwest where slit trenches have completely solved a surface drainage problem.

While calling at Somerset Country Club in St. Paul, Minn., two years ago, Gerry Murphy,

Use of chain saw (left) is convenient way to make tiny slit trenches in green. Fairway slit trenches (right) are wider and deeper.



Bill Madigan of Forest Lake Country Club in Detroit (left) stands amid "herringbone" slit trench design on one of his greens. Al Bunn, Illini Country Club, Springfield, Ill., (right) shows slit gravel trenches draining into a creek from low fairway area

golf course superintendent, pointed out small slit trenches he had placed on the putting green in an effort to drain low, water-holding pockets. Such pockets were inclined to cook-out every summer. These trenches were made with a chain saw, using an old blade.

After the removal of soil he had a clean trench approximately 10 inches deep and ¼ to ⅜ inch wide. The trench was then filled to the surface with a calcined clay product. Gerry watered the green heavily and drainage took place. It was amazing the effect the small drain trenches had on surface-draining this green. After two years, the originally installed trench continues to be effective, even though the green has been aerated, the cores chopped and top-dressing applied.

To date, it is impossible to determine exactly how long small trenches will remain open. Even if clogging does occur, the upper inch or so of "dirty" calcined clay could be removed and replaced quite easily. Satisfactory putting turf forms over trenches within one week to ten days.

As a result of the information gathered by talking with Gerry Murphy, I have suggested to many other golf course superintendents that small, chain saw slit trenches be installed in greens where water-holding pockets are a problem. The success is truly amazing. The picture showing Bill Madigan standing on one of his greens at Forest Lake Country Club in Detroit is a good example of how slit trenches are to be placed. The area where the flagstick shows, or the area to the right of and slightly behind Bill, is the culprit in this instance.

The water-holding pocket that existed here was so serious that they decided to completely rebuild the green. But as a result of the herringbone slit trench installation, the green has not been rebuilt, and the low, water-holding area is no longer a problem. Even though the trenches in this picture appear to be wider than ¼ to ⅜ inch, this is simply because the job was completed just before the picture was taken and extra calcined clay is lying on the surface.

I have seen numerous types of slit trenching on greens, beginning with simply one slit dug through a low, water-holding area and continuing off the green. With others, a complete herringbone arrangement such as the one in the picture above are installed. Of interest here, off the front of the green in the collar area, the small slit trench actually runs into one of the three-inch wide gravel-filled slit trenches. Bill wanted to be sure the entire area drained rapidly.

It has been observed that slit trenching is an excellent tool for use on a golf course. We have found that it is far easier to maintain turfgrass in top quality condition if surface water is rapidly removed. Even though observation has not allowed any decisions to be formed to-date, slit trenches may also be effective in removing surplus water in winter where danger-ops ice sheets are inclined to form.