

How We Built Our Oiled Sand Greens

By Wright D. Taylor
Live Oak Golf Club, Weatherford, Tex.

In common with golf courses in this section of the country, where rainfall is inadequate for the maintenance of grass putting greens, our club, being unable to install a sprinkler system, was confronted with the problem of the proper construction of sand greens. The sand greens as first built were very unsatisfactory because the heavy rains churned up the sand, washed it off, and floated the lighter fuel oil out of the sand onto the fairways. This not only interrupted play, but necessitated a continuous outlay for labor and material in replacing sand and oil. In the winter of 1926 the sand greens were rebuilt, and we now have no trouble from the loss of sand and oil by wind and rain.

Our course is located on a high ridge or divide with headings of small draws or valleys leading out from the ridge. The soil on the ridge is rather poor, with layers of stone underneath, and the grass is poor. In the draws we have a good black soil and a splendid turf of curly mesquite grass. This grass occurs mostly here on black soil of a tight nature, although on gravelly land it seems to thrive well but the turf is not as thick as on good soil. In very dry weather it does not die, but becomes yellow and remains dormant. Our annual rainfall is 32 inches, heavy rains usually occurring 3 to 6 weeks apart in June, July, and August, with warm to hot, clear sunshine during the period. In March and September we usually have considerable wind.

Our sand greens are 42 feet in diameter and are built on the native soil. In rebuilding them 3 barrels of rather heavy fuel oil are first put on the base and allowed to soak in for a few days in order to kill the vegetation and to help keep the base from absorbing the oil out of the sand on the green. The base is tamped smooth and almost level, leaving the top of the cup about $\frac{3}{4}$ inch higher than the outer edge of the sand green 21 feet distant. The purpose of this slight rise is to keep as much water as possible out of the cup. It really helps rather than retards good putting. The cup holes, which are 3 feet deep, are filled to the bottom of the cup with small stones so as to permit quick drainage of any water in the cup.

For about a foot around the cup the hard base is leveled with the top of the cup so that in play the sand can be dragged on this to a depth of $\frac{1}{8}$ to $\frac{1}{4}$ inch, which is sufficient to permit a ball to run true if struck true. This also prevents the players creating a saucer-like depression of several feet around the cup resulting from their dragging sand away from instead of toward the cup and dragging the sand too firmly. This hard ground around the cup also, to a large extent, prevents sloughing of the side walls of sand into the cup and creating a hole at the top that is much wider than the regulation $4\frac{1}{4}$ -inch cup.

In our case we obtain a mixture of limestone gravel and sand washed into ravines. We first screen out the rough particles through a screen of 8 meshes to the inch, and then screen out the dirt and very fine sand through a screen of 24 meshes to the inch. It is this dirt and very fine sand which, in our opinion, is the chief cause of

sand greens becoming packed by rains and players. The portion of the material saved for use is about 20 per cent of the whole. This is then thoroughly worked in a mortar box with heavy oil or residuum until the sand has absorbed all the oil it can. At first thought this amount of oil might seem to be too much; but after the sand is spread, much of the oil will pass down into the base, and that on the surface dries out to such an extent after a few days that it will not stick to the players' shoes. The screening of and working oil into the sand should be done when the material is thoroughly dry, as it can be done much better when in that condition and at far less cost, the process being a tedious one at the best. As this residuum is a rather heavy oil, it can not well be worked into the sand in cool weather. In this case it should be well heated or thinned with a very small amount of light fuel oil. The sand is spread only 1 inch deep on the green, because only a light smoothing of the surface is required to permit a ball to run true, and it is deep enough to cause a ball to stick to the sand green if it hits the near side from a good distance—up to about 50 yards in case of a mashie shot of fair height. A few weeks later, after rains and play tend to pack the sand, the surface will need to be regularly roughed up to a depth of about $\frac{3}{4}$ inch and dragged with a mat. We use light drags made of two pieces of half-round $1\frac{1}{4}$ -inch moulding nailed together, with a flat handle of about $\frac{1}{4}$ by $1\frac{1}{4}$ inches.

Our sand greens have sodded dirt rims and are built sufficiently high to accomplish their purpose of keeping outside water off and washing rains from removing sand and needlessly floating the oil. To facilitate play the rims are tapered several feet outward to a feather edge, leaving the surface a rather gentle swell. Rain water on a sand green is drained off through one or two 2-inch gas pipes set into the rim of the green, which, after a rain, quickly drain off the water, soon putting the sand green in a condition for play.

Prior to July, 1930, we had not begun to remove the dirt and fine sand from the material used on the greens, which we consider to be the chief cause of packing. The old sand greens, prior to that time, had nevertheless gone a long time without requiring reoilng and were splendid greens when properly roughed up and dragged with a mat. The sand greens we reconstructed in July, 1930, by removing the dirt and fine sand, appear after a year to be as good as they were the day they were finished, which is certainly enough to satisfy anyone.

We attribute the satisfactory results we have had with our sand greens largely to the coarser sand which we use, but especially to the heavy residuum from oil refineries or cleanings from old fuel-oil supply tanks of steam users which we use in place of the ordinary light fuel oils. There is little oil in the residuum to dry out and float off, and it serves its purpose of holding the sand together. Our sand greens will not need to be reoiled more often than once a year, and probably less often.

Greens at the foot of a hill should be protected from surface or seepage water from the hill, by ditches or underground drain tile. A foot or two of crushed rock under the ditch will help greatly to improve the drainage.