

## Bermuda Turf on Beach Sand

By Fred Hoerger

Bay Shore Golf Course, Miami Beach, Fla.

The site of the Bay Shore Golf Course was an expanse of white beach sand at the time of its construction in 1921. The areas for the fairways were surfaced with a layer of black sandy soil several inches thick, and the grass was planted on this surface. In building the greens a mixture of this black sandy soil and marl topsoil, in equal proportions, was laid over the sand, and the grass then seeded. The tees were built up in about the same manner as the greens, about 6 inches of the same soil mixture being used. No soil was added to the rough, the grass being planted directly in the sand. The course has been in play since January 1, 1923, but is not open throughout the entire summer. We have had no trouble with sour soil, but have had trouble with salt. This was very difficult to overcome, success being attained only after proper drainage had been installed.



Bermuda grass responds well to fertilizer. The grass throughout this picture is Bermuda grass. On the left is the starved semi-dormant grass of the rough and on the right is the fertilized fairway turf which grows vigorously even in winter.  
Bay Shore Golf Course

Since their construction the fairways have been top-dressed several times with a marl topsoil and have been regularly fertilized. The fertilizer we use on the fairways is a 3-to-1 mixture of castor bean pomace and sulphate of ammonia. This is applied at the rate of 1,200 to 1,500 pounds to the acre. About four applications are made each year at intervals of 5 or 6 weeks, beginning about the middle of October. It is warm enough here during the winter so that, with plenty of fertilizer and water, the Bermuda grass will maintain a beautiful dark green color throughout the winter. Only the past three years have we been watering the fairways. We mow the fairways whenever needed, which is usually about twice a week.

On our Bermuda grass greens a northern grass is sown for winter play. About the first of October the Bermuda grass is cut very short, raked, brushed, and top-dressed sufficiently so that, after dragging the green with a mat, simply the very top of the grass will show through the dressing. The top-dressing consists of 4 parts of black

sandy soil and 1 part of marl topsoil. This black sandy soil consists of sand and well-decayed muck in about equal proportions. We do not keep a compost pile or soil bed. Usually no fertilizer is used when the top-dressing is applied, since it would produce too much growth of the Bermuda grass. About a week or two after the Bermuda has had time to come through this top-dressing, and while still thin, we usually seed the greens with Kentucky bluegrass. We have tried different grasses, but get the best results from Kentucky bluegrass alone. This is seeded at the rate of 6 or 7 pounds to 1,000 square feet and covered with sufficient of the same top-dressing material to cover most of the seed. We have found that at this time it is best not to use any nitrogen fertilizer, in order to prevent setting back the development of the winter grass by inducing a vigorous growth of the Bermuda, but at the same time a small amount of a phosphatic fertilizer will greatly help the young seedlings. About every two weeks after the young grass is strong enough we apply a good, balanced fertilizer analyzing 5-8-2 or 6-8-2 at the rate of 10 to 15 pounds to 1,000 square feet. When the winter grass has become well established, we top-dress the putting greens every three or four weeks, and fertilize at the time of top-dressing, using mostly organic fertilizers such as activated sludge applied at a rate as high as 20 to 25 pounds to 1,000 square feet. The fertilizer is applied with a spreader, not mixed with the top-dressing but on top of it and before it has been dragged with the mat. The dragging mixes the fertilizer with the top-dressing and also greatly reduces the danger of burning. The greens are mowed by hand early each morning, and rolled with a light roller two or three times a week.

We have not found it necessary to have separate greens for summer and winter play, since the winter grass disappears gradually in the spring and the Bermuda returns to form a vigorous turf with surprising rapidity.

Our water is supplied from the City of Miami Beach and is purified. The fairways are watered twice a week when needed. Two men, starting early each morning, water from 4 to 5 fairways, depending on the size. We have a 1-inch hose system and, with a  $\frac{3}{8}$ -inch nozzle, pressure at the sprinkler is 125 pounds. The valves are at the edge of the fairways, about 150 feet apart. Three to six sprinklers are used on each fairway, according to size. One man changes the sprinklers on two or three small fairways. The sprinkling is completed by 8 or 8.30 o'clock, when the hose and the sprinkler are removed, and the hose coiled at the side of the fairway. On three or four short holes, only the approaches to the green are watered and the green sprinkler is used for this purpose. In the late afternoon the hose and sprinkler are moved to the fairways that are to be watered the next morning. Starting about 6 o'clock in the morning, one man waters the greens, using the same type of sprinkler as used on the fairways but with a smaller nozzle. The whole area of the putting green is covered without moving this type of sprinkler. The sprinklers are set and allowed to run for about one hour. The tees are watered in the early mornings about twice a week. The tees have underground pop-up type sprinklers controlled by a valve at the side of the tee, and the entire tee can be watered in 10 or 15 minutes.

About the only turf disease with which we are troubled at Miami

Beach is a fungous disease resembling brown-patch. It can be controlled by applications of corrosive sublimate and calomel or any of the remedies on the market for brown-patch. We are rarely bothered by this disease except in the young winter grass.

The mole cricket attacks our greens and tees, but does not bother the fairways. To control this insect on the putting greens, we apply from 5 to 7 pounds of arsenate of lead to each 1,000 square feet early in the fall with the first few top-dressings. This is either mixed with the top-dressing or applied on top of the dressing before it is dragged. During the winter the arsenate of lead is also applied each time we top-dress the greens, but in much smaller quantities. The tees are treated in the same manner as the greens whenever they appear to be in the need of treatment.

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### A Winter Course on a Limited Budget

By Terry Dolson

Punta Gorda Country Club, Punta Gorda, Fla.

The Punta Gorda Country Club occupies 105 acres of uniform sandy loam on flat, slightly sloping ground  $1\frac{1}{2}$  miles from Charlotte Bay. The highest elevation is but  $13\frac{1}{2}$  feet above sea level with a tide-water creek entering the property for a short distance. The present course was built in 1928, utilizing such improvements as have been made since I came to Punta Gorda in 1922, and was opened for play in January, 1929. It is essentially a winter-resort course which must be maintained on a basis of strict economy working on a limited monthly budget. From April to September a mechanic and one laborer are employed to keep the fairways mowed and to haul in at least 350 cubic yards of top-dressing. From October to March four additional laborers are employed. A daily record kept on a form sheet helps me to plan the work economically.

Proper drainage was the main consideration in the construction of the course because the carpet grass, which thrives in this section, requires sufficient drainage to remove standing water without lowering the water table. Marl pockets are occasionally encountered several feet below the surface but I have never noticed a trace of marl in the topsoil. Playable ditches 10 yards wide were dug 1 foot deep on the high back part of the property, gradually increasing to a depth of nearly 3 feet on the lower, front part. This drainage system intercepts water from the back country and discharges into a pond developed from the slough and into two artificial ponds. The water level holds up well in these ponds during the dry winter months. The excavated dirt was used for building putting greens and tees, and the muck from the slough was used for the top 5 inches of the putting greens and tees. All ditches are water hazards, turfed, and playable except during the rainy period. The ponds have a depth of from 2 to 4 feet during the dry months. Their banks are turfed and kept mowed to the water's edge. We have not tried to keep the ponds cleared. Rushes grow along the banks of the ponds and water lilies have been introduced. There is good bass fishing in the big pond, and one or two alligators sunning themselves on the banks prove a source of interest to the winter golfers.

We have an adequate water supply from two 6-inch wells sunk 400 feet in sand. The water is pumped directly to the putting greens,