

which interferes with root penetration because it limits the natural movement of water. Power greens renovators are now being sold for the purpose of removing mat. Probably the most successful tool for this purpose is the old Del Monte rake mounted on power equipment. Even the common garden rake, with sharply filed teeth, will do a creditable job in the hands of a workman with a strong back.

4. *Brushing and Combing*: The use of brushes or combs mounted on the green mowers will tend to discourage mat formation and should be used during periods of vigorous growth. However, they will not, as is thought by some, eliminate the problem.
5. *Aerating*: The use of aerating machines, available in a wide range of makes and sizes, to cultivate the soil under an existing turf is so well established that its value hardly bears repeating. It has been established that bacteria require oxygen, moisture and nutrients to break down mat. Also, one commonly observes that under conditions of heavy thatching on sloping greens, much of the fertilizer and water applied runs off the surface and is wasted. Aerating machines are essential tools to correct these problems and most golf courses rightly consider them to be as necessary as the mowers. Aerating naturally ties in with raking, top-dressing if needed, fertilization and lime to correct acidity.

6. *Drainage*: Good drainage is paramount if success is to be obtained in combatting mat. Standing water and slow percolation of water will nullify results of the management factors previously discussed. When soils are saturated, air is nearly excluded and organic build-up is bound to occur. This condition is typical in swamps where undecayed vegetation may be several feet deep. Under-drainage and a uniform, layerless soil mixture are the answers to good sub-surface and internal drainage.

Conclusion

How can the individual club know whether or not this insidious problem of mat belongs to them or is related only to the fellow down the road?

You can't see it from the surface, but you can feel it under foot and the superintendent can always tell by the simple process of cutting out a plug of turf.

The age of the green doesn't mean very much. The writer has seen one and a half inches of mat on a green only one year old! Still, mat might be likened to old age in that it creeps up gradually over a period of years. Unlike old age it can be corrected and prevented before deterioration of turf and playing conditions occur. Therefore, periodic checks should be made. Certainly, if the mat is more than one half inch in depth, it would be worthwhile to drag this article out of the file, assemble your fighting legions, and fire both barrels at "public putting enemy number one."

BENTGRASS GREENS FOR THE SOUTH

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Our experiences with bentgrass greens at the Richland Golf Club, in Nashville, Tenn., indicates that bentgrass greens can be grown and maintained throughout the entire year in the South. Here at Richland we have had one bent green for four

years and we constructed a new practice green with bentgrass during the fall of 1951.

Since we have been growing bent, we have had temperatures as low as 15° below zero and as high as 107°. For ten months out of the year the bent greens have been trouble-free. Only during July



John E. Hood Photos

Chester Scott and Claude Woodall watch Emmett Reed putt on the new bent practice green at Richland Golf Club, Nashville, Tenn. The members at Richland like the new bent greens.

and August do we have to watch them closely and use the best of management practices concerning water, fertilizer and fungicide applications.

Because of our success we plan to convert all of our greens to bentgrass. Cherokee Country Club, in Knoxville, opened 18 new bent greens for play in 1951. Chattanooga Golf and Country Club, with Alex McKay in charge, completed 18 new bent greens in the fall of 1951 and opened them for play in May, 1952. The summer of 1952 was a bad one for bentgrass, but the greens at Knoxville, Chattanooga and Nashville all came through the summer without too much trouble and, by the fall of 1952, they were all in good shape, with no more worries until July, 1953.

Creeping bent greens can be grown and maintained the year-round in the South. They will be more successful, however, if certain steps and principles are employed when the greens are being planned and

before they are built. We consider these points extremely important:

1. *Construction of the green.* We feel that tile drainage is an essential for a successful bent green, particularly in the South. The tile line should be laid and the trenches back-filled with pea gravel. The proper mixture of topsoil is most important to provide for internal and sub-surface drainage. To provide for surface drainage there should be a fall of about one foot to each 50 feet.
2. *Mixture of topsoil for the greens.* At Richland we used 65 per cent coarse sand, 20 per cent loam soil and 15 per cent peat, all by volume.
3. *Selection of the bentgrass.* In our experience Arlington (C-1) creeping bent has proven to be the best strain of grass at Richland. In some areas the combination of Arlington (C-1) and Congressional (C-19) gives splendid results. As one goes

South we hear reports of Cohansey (C-7) doing exceptionally well where the summer temperatures are even higher than they are here at Richland. Seaside bent has performed reasonably well in Texas, but there are indications that some of the improved strains may be superior to the old Seaside. Old Orchard (C-52) bent and the new polycross creeping bent from seed might also do well, but, so far as we are concerned, the latter two have not yet been proved.

After the bent greens have been properly built to provide the best possible sub-surface, internal and surface drainage, the management of the grass becomes most important. We feel that these factors must be followed with great care:

1. *Water management.* This is probably the most important function. We feel that the greens should be watered when needed during the early morning and watched throughout the day for wilting, particularly during the heat of the summer. When wilting occurs, we give the green a light syringing or sprinkling during the day, just enough to keep the grass cool. This restores moisture in the blades of grass which become wilted because the water is being lost from the leaves faster than the roots can take it up from the soil.
2. *Select the right fertilizers and adhere*

COMING EVENTS

April 15-16: Seventh Annual Southeastern Turf Management Conference, Tifton, Ga. B. P. Robinson.

May 11-12: Turf Conference, Southern Turf Association. J. E. Hamner, superintendent, Memphis Country Club, Memphis, Tenn., general chairman.

June 8: Turf Field Day, Central Plains Turf Foundation, Wichita, Kan.

August 3: Field Day, Purdue University, West Lafayette, Ind. W. H. Daniel.

October 21-23: Fourth Annual Central Plains Turf Foundation Turf Conference, Manhattan, Kan. William F. Pickett.

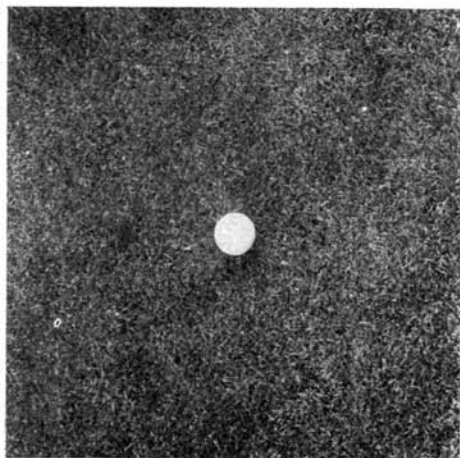
November 16-20: American Society of Agronomy Meetings, Dallas, Texas. L. G. Monthey.



A plug from the new bent practice green at Richland Golf Club, Nashville, Tenn. Roots have been found in this green as deep as ten inches

to a regular schedule. At Richland we used Vigoro at the rate of 20 pounds to each 1,000 square feet in March and November. Any similar fertilizer of approximately the same analysis probably would give equal results. From April through October, once each month, we used a mixture of Milorganite and 60 per cent muriate of potash at the rate of 15 pounds of Milorganite and 4 pounds of potash to each 1,000 square feet. These materials were mixed and applied together. We use no fertilizers during December, January and February.

3. *Select the right fungicides and establish a regular schedule for prevention of disease.* We find that this regular application of fungicides is a preventive schedule and has produced excellent results. During hot, humid weather extra applications of fungicides will be needed. At Richland we use three ounces of Tersan to each 1,000 square feet, and, mixed with the Tersan, we apply one ounce of Calo-Clor to each green. This mixture is sprayed on each week. In addition we used Cadminate at the rate of 1½ ounces to each



Closeup of the practice green at Richland Golf Club. This green has a mixture of Arlington (C-1) and Seaside bents. The green was constructed in September, 1951.

1,000 square feet every two weeks. As a result of this spray program we had no large brown-patch nor any dollarspot in our greens last summer, and we believe this is due to our regular preventive treatments. During the summer of 1952 we did have an attack of pythium but a light application of hydrated lime seemed to check this disease. We used the hydrated lime at the rate of four pounds to each 1,000 square feet and dusted it on. We allowed this to remain on the green, without watering in, for two days.

We started our preventive treatments of Tersan, Calo-Clor and Cadminate about May 15 and stopped the treatments September 1.

As you can see, we are well sold on bentgrass greens, and we believe they can be grown and maintained the year 'round in the South at less cost than maintaining bermuda and rye greens. Here, we feel, are some of the advantages of bent greens:

1. We have a putting green of the same texture throughout all the year.

2. We have no transition periods, such as we used to have, when we converted from bermuda to rye and vice versa.

Here, we feel, are some of the savings we have in bent greens:

1. We have no bill for ryegrass seed in the fall.
2. We have no bill for bermudagrass seed in the spring.
3. We use less water than formerly because of the proper mixture of topsoil and good drainage.
4. We use about 50 per cent less fertilizer than we did on bermuda.
5. We have saved a great deal of labor because we do not do as much mowing and we do a lot less topdressing. Our bermuda greens needed to be topdressed four to five times during the bermuda season and one to three times during the rye season. For bentgrass we feel that one topdressing a year should be ample. The savings on topdressing material and on labor to prepare and to spread the material on greens will be highly significant.

In conclusion, I would like to state that, now we know bentgrass is adaptable to southern climates, we southern greenkeepers owe it to ourselves and to our clubs to experiment with bentgrass in our own localities and to give a thorough trial to the best grasses known for putting greens.

PARK EXECUTIVES

The American Institute of Park Executives has appointed Emile (Bim) Mardfin as its new Executive Secretary. Mr. Mardfin took up his new duties March 1, after retiring from the New York City Park Department, where he had been serving as Assistant Director of Maintenance and Operation. He was responsible for the complete rehabilitation since the war of New York's ten public golf courses and its 20-acre pitch-and-putt course.