CONTROLLING DRY SPOTS

DRY SPOTS OFTEN DEVELOP, especially on old turf during the summer months, from water running off without adequately wetting the soil. These dry spots may be caused by an accumulation of dead grass or thatch on the soil surface, when the soil develops hydrophobic properties, or for other reasons unknown or at least not understood. Dry spots become dead spots on golf putting greens if the golf course superintendent does not recognize the symptoms in time to get water into the root zone. The greens are frequently overirrigated to avoid such conditions, causing other problems.

This experiment was set up at the Arrowhead Country Club, San Bernardino, to test management practices believed helpful in the control or elimination of dry spots. A 34-year-old green with a history of hard-to-control dry spots was selected. The turf of Seaside bentgrass was originally planted in a well-drained soil. This typical old green had developed severe compaction in the center and traffic areas. Four to six inches of the surface soil was stratified by regular top-dressing with sand over accumulated thatch. Disease control was often a problem.

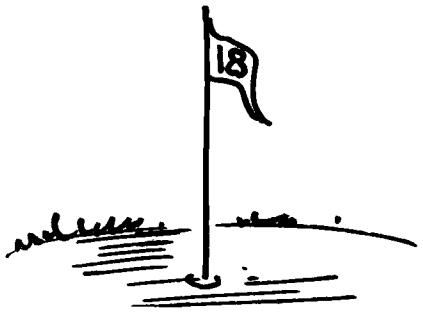
Cultural practices tested included verticutting to prevent the accumulation of excess thatch; aerification with quarter-inch spoons to facilitate entry of water into the soil; and the use of a commercial wetting agent, or surfactant, to increase the wettability of the soil.

Alternate 40-inch-wide strips were verticut north and south across the green on April 19, May 17, June 14, July 19, and August 23. Alternate 48-inch-wide strips were aerified east and west on May 3, May 26, June 21, July 26, and August 30. Twenty-five blocks were selected at random, each block containing the eight-treatment combinations. The wetting agent was applied August 9, at 4 gallons per acre in 120 gallons of water, and immediately watered in (a rate much higher than normally recommended for the material used).

The irrigation frequency was deliberately manipulated to encourage development of dry spots. The experimental green was checked each afternoon and often two times a day. Dry spots were located by turf color, and confirmed by probing with an ice pick, and when necessary, with a golf shaft soil tube. The location of the dry spots was recorded by measurements from at least two of the four permanent sprinkler risers. Each day's data was plotted on a different 1:100 scale map. Dry spots less than 18 inches were plotted as a single point, while four measurements were made to outline larger dry spots. After measurements were recorded, hand watering of dry spots was frequently necessary to avoid excessive injury to the turf. The entire green was then thoroughly wetted the next morning and the entire procedure repeated.

At the conclusion of the experiment, an evaluation was made of the direct and indirect effects on turf appearance by the cultural practices tested. On September 25, the entire experimental area was marked with a grid of string. Each plot in the experiment was given a coded tag. Twenty judges including golfers, agronomists, and golf course superintendents

Monthly aerifying was an aid to controlling the development of dry spots and did not cause cumulative injury on a Seaside bentgrass green during 1963 summer tests in San Bernardino County. Verticutting during the summer heat caused some injury to this fine turfgrass, but was also of some value in controlling dry spot development as thatch built up late in the season. Wetting agents aided in controlling dry spot development, but were detrimental to the appearance of the turf on this green. The tests also proved that it is possible to conduct complex experimental work on golf greens, if the management and players understand the importance of the work and the research is scheduled to cause a minimum of inconvenience to the golfers. Inexperienced judges were found capable of appraising visual effects of different management practices on the turf.



ON GOLF GREENS

F. W. DORMAN
C. L. HEMSTREET
T. M. LITTLE

The effect of cultural practices performed on a putting green was scored by twenty judges. The 200 plots in the experimental area were given coded tags to avoid bias.

were asked to score each of the 200 tagged rectangles from 1 to 10 (1 being the poorest, and 10 the best). Data on the frequency and location of the dry spots and scores from the terminal turf appearance was then statistically analyzed.

Monthly aerifying with quarter-inch spoons, leaving the holes open, practically eliminated the development of dry spots. These results were highly significant. Turf scores on the aerified plots were not significantly higher than on the nonaerified plots. However, the judges' ratings definitely indicated they did not believe this practice was detrimental to turf in this test. Nine months after the last differential treatment, the strips that had been aerified produced a significantly greater weight of grass clippings than did the nonaerified strips.

Verticutting did not reduce the number of dry spots until late in the experiment, and was then only slightly beneficial. This might be expected, as the green carried a minimum of thatch going into the experiment. As the thatch began to accumulate late in the experiment, beneficial results were observed. Turf scores for the verticut areas were significantly lower than for the nonverticut.

The wetting agent, used only during the last portion of the experiment, caused a highly significant decrease in number of dry spots. However, the average turf score for the wetting agent plots was lower than that of the plots receiving no wetting agent. The difference was highly significant. Attempts were made to run infiltrometer tests on the different treatments. The data indicated too much variation existed within treatments for results to be dependable without an impractical number of infiltrometer replications. Tests indicated that even in the control plots, the oxygen diffusion rate was not a limiting factor.

Although the grass on this green was repeatedly put under stress to develop dry spots, no turf was lost for this reason. Severe attacks of the fungus *Helminthosporium* occurred during July and August. Weekly treatments with recommended fungicide combinations did not prevent the loss of some grass. The fungus injury appeared to be less severe in the aerified areas.

During one portion of the experiment, low output sprinklers were used. These had a precipitation rate of .16 inch per hour, compared to .35 inch per hour for the sprinklers normally used. During the use of the low output sprinklers, tensiometer readings indicated it was possible to use more of the available moisture in the root zone before dry spots occurred. It was also easier to rewet the dry spots after they occurred.

With only a minimum of written instructions, judges were remarkably consistent in their scoring. Only one of the 20 had previously scored turf. It took most men about two hours to do this scoring.

F. W. Dorman is Farm Advisor and County Director; C. L. Hemstreet is Farm Advisor, San Bernardino County; and Thomas M. Little is Biometrician, University of California, Riverside.

The experimental putting green was checked daily for the occurrence of "dry spots." When found, they were marked, then located by measuring from permanent reference points and plotted onto a 1:100 scale map.