

Shoe Sole Tests to be Broadened

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An article in the USGA Journal for November, 1958 described the results of experiments at Texas A. & M. College designed to measure the relative damage to turf caused by various types of shoe soles. The last sentence of that article reads, "The results of this experiment indicate that, according to these techniques and under these conditions, there is no basis for discriminating against ripple sole shoes." These emphasized words and phrases are standard equipment for the experimenter. This is true because few experiments can be expected to yield conclusions that will hold true under all conditions.

The matter of shoe-sole types is a controversial one. Opinions about the ripple-sole shoe especially, whether for or against, appear to be very definite. Experiments reported in the USGA Journal article were designed to find some factual basis for answering questions about the damage caused by ripple-sole shoes.

Briefly stated, these experiments sought to determine turf damage resulting from the use of various type soles and to determine the effect of ripple sole footprints on the course of a rolling golf ball.

Traffic damage to turf was measured by determining the amount of turf worn out (evaluated by visual ratings and the double quadrat technique) and the degree and pattern of soil surface deformation. These measurements indicated that spikes and cleated sole shoes both did more damage than ripple soles.

In putting tests, a ball was rolled across the turf by means of a specially constructed device that rolled the ball at a constant speed and in the same direction. It could not be demonstrated that footprints in the path of the ball produced any effect upon the point at which it came to rest.

Challenges to the validity of these conclusions were almost certain to be forthcoming. Ripple-sole shoes have been barred from some clubs. The clubs which have taken this step are almost certain to have weighed the matter carefully before arriving at a decision to do so.

Unfortunately, experimenters do not always anticipate the ways in which golf-

COMING EVENTS

- February 20
Tri-State Turf Conference
Knoxville, Tenn.
- February 23-24
Southern Turfgrass Conference
Ridgeway Country Club
Memphis, Tenn.
Reg Perry, P. O. Box 2057 DeSoto Station, Memphis, Tenn.
- February 25-27
Minnesota Golf Course Superintendents Association Turf Conference
Lowry Hotel, St. Paul, Minn.
- March 2-4
Midwest Regional Turf Conference
Memorial Center, Purdue University
Lafayette, Ind.
Dr. William H. Daniel
- March 5-6
The University of Massachusetts Annual Turf Conference
University of Massachusetts
Amherst, Mass.
Dr. Elliot C. Roberts
- March 12-13
Annual Michigan Turfgrass Conference
Michigan State University
East Lansing, Michigan
Prof. James Tyson
- Tentative April 6-7-8
13th Annual Southern Turfgrass Conference
Tifton, Ga.
Dr. Glenn W. Burton

ers will use equipment. These experiments measured the effects of traffic resulting from walking. The walkers did not execute turns which would produce a tearing action, nor did they practice the application of body English with feet firmly planted. The tests were made on only one kind of grass, Seaside bent. They were done during only one season, spring and early summer. They were made at only one location, College Station, Texas. They were carried out on only putting green turf.

At any rate, comments concerning the work reported are such that it seems necessary to continue experiments along this line. As mentioned, one of the criticisms has been that the tests failed to consider turning action by the players. This has been stated very well by Mr. Richards S. Tufts, of Pinehurst, N. C., who says:

"The difficulty is that the soles cause no trouble when people walk on them as

vas done in the tests, but they literally tear the turf whenever there is any turning action whatever. This naturally creates a great deal of damage on the tees and unfortunately this twisting action is quite common on the greens, either in the application of body English, in turning, or in lifting balls from the cup.

"The universal opinion of all I have talked to has been that the tests which were made were inconclusive because of their failure to take into account the effects of any turning action."

The kind of experimentation that would provide answers to problems of traffic and turf wear would appear to be increasingly important. A greater amount of play, higher standards of maintenance and the growing popularity of motorized golf carts are all factors contributing to traffic effects on turf. Relatively little attention has been given to a study of the traffic problem as such, even though other turf research efforts have recognized that traffic is an important consideration. An example is the research done on putting green soils which attempts to discover ways to offset the compactive effects of traffic on wet greens.

Observations of the distribution of *Poa annua* on putting greens suggest that the incidence of this grass may be related to the wear inflicted or to the compactive effects of traffic. This also appears to be true in the case of disease incidence.

Research of this kind is difficult for several reasons. There are many vari-

ables that contribute to traffic damage. Among them are soil type, soil moisture content, kind of grass in the turf, height of mowing, frequency of traffic, kind of traffic, pounds of force exerted, shearing action present, etc.

Adding to these difficulties are those attendant to the measurement of damage. Damage resulting from traffic does not follow a straight line relationship to the amount of traffic imposed. As an example, in the foot traffic tests previously described, there appeared to be little damage to the paths during the first two weeks, but during the third week the paths subjected to traffic from spiked shoes deteriorated almost to the vanishing point.

Criteria other than visual evaluation are needed for accurate reporting of experimental results. The application of turf quality evaluation systems to the problem of traffic damage is a matter that has been given very little attention.

The matters which have been discussed in these paragraphs bespeak a need for continued research in the area of traffic damage in general and of shoe sole types in particular. Questions of shoe sole damage have by no means been settled and a study of golf cart tire damage has not even begun. Research along this line is a prerequisite to intelligent regulation of traffic which may damage turf.

Golf Course Climates

The north slope and the south slope of a putting green may be 120 feet apart and subjected to a difference in climate that would be expected to occur over a distance of several hundred miles. Dr. Ray Keen, of Kansas State College, made this observation in a recent turf conference talk.

A Kansas putting green with a north slope, tilted so that the sun strikes at a low angle, has fewer frost-free days, the temperature is lower, the evaporation and transpiration rate is lower and cool-season grasses are likely to thrive. The south slope of the putting green catches the sun's rays more directly, its growing season is longer, the temperatures are high, the soil dries out rapidly and cool-season grasses suffer.

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