

Members of the Sponsoring Committee designated to raise the necessary funds are: H. Alfred Langben, Chairman, Sleepy Hollow Country Club, Scarborough, N. Y.; Glen H. Van Buren, Siwanoy Country Club, Bronxville, N. Y.; David M. Goodstein, Quaker Ridge Golf Club, Scarsdale, N. Y.; and Harold LeFurgy, Treasurer, Winged Foot Golf Club, Mamaroneck, N. Y.

Members of the Research Committee designated to outline and direct the project are: Dr. G. H. Ahlgren, Chairman, Rutgers University, New Brunswick, N. J.; Dr. J. A. Adams, New York State Agricultural Experiment Station, Geneva, N. Y.; Dr. J. H. Schread, Connecticut Agricultural Experiment Station, New Haven, Conn.; and Dr. J. F. Cornman, Cornell University, Ithaca, N. Y.

The greenkeeping profession is represented by Carlton Treat, Montclair Golf Club, Montclair, N. J.; Ben Zukosky, Links Club, Roslyn, N. Y., and Lloyd Scott, Woodway Country Club, Springdale, Conn.

Mr. LeFurgy is receiving contributions

from golf clubs to defray the expenses of this research project. The USGA Green Section urges clubs to contribute to the program because of its importance and because sufficient funds are not available from the USGA or experiment stations. Contributions should be sent to Harold LeFurgy, Winged Foot Golf Club, Mamaroneck, N. Y.

Greenkeepers and superintendents who suspect the presence of the tropical earthworm are invited to send specimens to Dr. G. H. Ahlgren, Rutgers University, New Brunswick, N. J., who will have them identified by the Zoology Department. The worms may be mailed in a closed bottle containing moist soil. Dr. Ahlgren will welcome correspondence concerning observations on possible control measures or other pertinent information which may assist the Research Committee in its work.

(Acknowledgment: We acknowledge with thanks the material prepared by Ralph E. Engel and Gilbert H. Ahlgren of Rutgers University, which was drawn upon freely in the preparation of this report.)

STEEL SPIKES vs. LUG SOLES FOR GOLF SHOES

A Report on 1948 Trials by USGA Green Section

By FRED V. GRAU and MARVIN H. FERGUSON

Varying reports had reached the Green Section office on the merits and demerits of lug soles on golf shoes. The matter came to a head following a talk with Richard Watson, Superintendent at Chevy Chase Club in Washington, D. C., who reported that lug soles were being prohibited at some courses because of damage to the greens.

W. E. Kavenagh, Goodyear Tire and Rubber Co., Inc., Windsor, Vermont, was contacted by Mr. Watson, who approached the Green Section for an impartial test. Shoes were furnished by Mr. Kavenagh, one pair fitted with standard steel spikes, the other with lug soles.

Tests were conducted on an area of five-year-old bent putting-green turf which was growing on native soil (silty clay) and had had no special preparation. Tests were be-

gun August 12, 1948. In order to simulate heavy foot traffic, single paths were laid out lengthwise on the turf area, which was 12 feet by 30 feet:

PATH No. 1
Lug sole shoe. Average weight of man 145 pounds

PATH No. 2
Steel spike shoe. Average weight of man 170 pounds

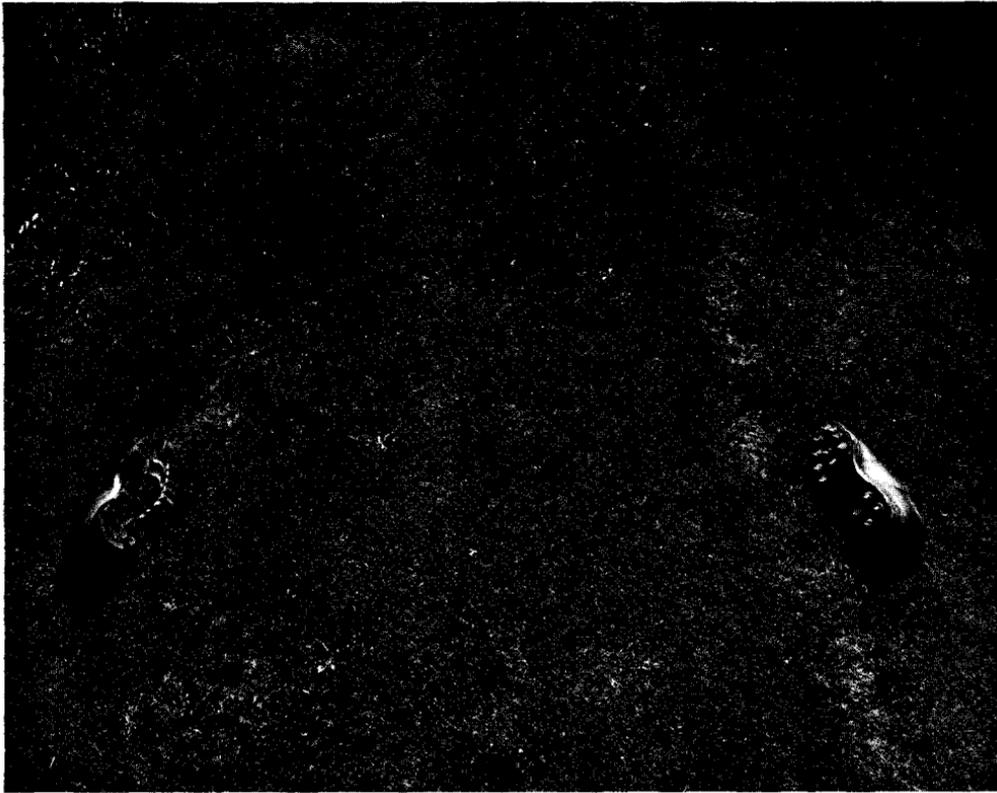
PATH No. 3
Steel spike shoe. Average weight of man 145 pounds

PATH No. 4
Lug sole shoe. Average weight of man 170 pounds

Each path (two footprints wide) was walked for 25 round trips each day on August 12, 13, 16, 17, 18, 23, 24, 25, 26. On August 12 the walking was done by Mr. Kavenagh and Dr. Grau. Thereafter the walking was done by Charlie Wilson, James Wilfong and Alexander Radko of the USGA Green Section.

On August 12 the turf was soggy from

Lug Soles Cause Less Damage Than Steel Spikes



Bureau Of Plant Industry, Soils and Agricultural Engineering-Photo by W. J. Mead

Relative wear produced by two types of golf shoes on bent putting turf. The shoes are lying alongside their respective paths. Photo was taken one month after wear test ended.

heavy rains. Mr. Wilfong, formerly Superintendent at Congressional Country Club, stated that if the green were on his course it would be closed to play. This indicates that the tests were made under the worst possible conditions for the grass. The soil is of such a nature that it becomes soggy when wet and very hard and compact when dry. No irrigation was done on this area at any time during the season.

At the end of the fifth round trip of walking on August 12 the lug soles began to show damage, whereas the steel spikes began to show visible injury only after the eighth round trip.

Damage from the lug soles appeared to be worse than from the steel spikes after the third day of walking.

From then on until the end of the test period, the damage from the steel spikes was greater than from the lug soles.

Spikes Cause Greater Damage

Damage to turf was greatest on path No. 3 (steel spikes, average weight 145 pounds). In diminishing order were No. 2 (spikes, 170 pounds) ; No. 4 (lugs, 170 pounds), and No. 1 (lugs, 145 pounds).

The difference in average weight did not appear to be a significant factor. Path No. 3 (145 pounds) produced worn-out turf before Path No. 2 (170 pounds) because it was lower and the soil remained soggy for a longer period.

Scuffing the shoes on the turf produced no apparent injury to the turf with lug

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TURF FIELD DAY AT BELTSVILLE

The first annual national open invitation Turf Field Day at the Beltsville Turf Gardens on Friday, October 15, 1948, was, according to the weather, perfect. The attendance was 175, and, according to the comments of the guests, it was an unqualified success. The USGA Green Section and the Bureau of Plant Industry, Soils and Agricultural Engineering, cooperating, were hosts.

Dr. Fred V. Grau, USGA Green Section director, opened the meeting at 9:30 A.M. at the flag pole in front of the Administration Building. Dr. R. M. Salter, Chief of the Bureau, greeted the group warmly and expressed friendly, open cooperation to the specialized uses of grass. H. E. Allanson, Assistant Chief of the Bureau and Chairman of the Station Committee (for developing the lawns and grounds) echoed Dr. Salter's sentiments, expressed appreciation for the cooperation of the USGA Green Section, and regretted that he had only one more year of active service.

Introductions included E. W. Van Gorder, from Palo Alto, Cal.; Prof. H. B. Musser, Pennsylvania Experiment Station, who is Editor of the new USGA book on "Turf Management for Golf Courses" and is in charge of the largest turf experimental set-up in the United States; three graduate students from Penn State—James Watson, Neal Wright, John Stanford; and Dr. Kenyon T. Payne, in charge of the turf grass breeding at Purdue University. The USGA was represented by Sherrill Sherman, Utica, N. Y.

Raymond Knight, Maintenance Foreman for the Bureau's Station Committee, had a display of the machinery used on the grounds. A tour of the Turf Gardens included:

Stop No. 1. Alta fescue lawn one year old, growing on sand, gravel and clay. Root growth was good. Turf is coarse and open but provides good appearance and setting for buildings. This area is designed for appearance only.

Stop No. 2. Ureaform trials on Alta fescue. Walter Armiger explained the manufacture and expected future of Ureaform fertilizers, which will feed turf more slowly and more evenly over longer periods of time than will inorganic nitrogen fertilizers.

Stop No. 3. *Zoysia japonica* planted vegetatively into existing bluegrass turf May 3, 4, and 5, 1948. Roger Peacock, professional, won a dollar bill for first finding two plugs of *Zoysia*. Z-52 establishes more easily than does Z-9.

Stop No. 4. Soil material from steam line excavations particularly unfavorable to good grass production.

Stop No. 5. Weed control plots: Dr. Chappell. Materials giving good results at other stations have not been impressive under Beltsville conditions.

Stop No. 6. The coffee at the cafeteria seemed to be appreciated by nearly everyone.

Stop No. 7. U-3 Bermudagrass sprigged vegetatively in July, 1947, had been aerified and overseeded with cool-season grasses in the fall of 1947. There has been no irrigation. Mowers are set at $\frac{1}{2}$ inch. The best-looking turf was produced with (1) a mixture of bent-grasses and (2) B-27 bluegrass. Roger Peacock hit eight-iron shots from different areas. No. 1 choice was the U-3 Bermuda and B-27 bluegrass combination. Divots were smaller and flew to pieces; turf was firmer. Divots

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Steel Spikes vs. Lug Soles

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soles, but the steel spikes tore the turf badly. Twisting the shoes for a stance damaged the turf more with the steel spikes than with the lugs.

After the walking ended, the turf on the paths where the lug soles were used recovered more rapidly than where the steel spikes had been used. The accompanying photograph shows the relative extent of injury and recovery 30 days after the walking stopped.

It is admitted that this test was not repeated a sufficient number of times on different grasses and under different soil and climatic conditions. It represents results at Beltsville on one grass on one soil type. It is believed, however, that this test was sufficiently representative to serve as a guide to further testing.

On the basis of the trial we can say that, under these conditions, there is no valid reason for barring lug soles from golf courses because of damage done to the turf.