Root-zone mix, thatch affect ball-roll in PSU's golf shoe tests

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Penncross creeping bentgrass greens maintained at 5/32 inches were used — one featuring an all-sand root-zone mix and the other a slightly modified root-zone mix.

Individual plots were arranged in a random, complete block design with three replications. Treatments consisted of three tread types: conventional metal spikes; soft-plastic spikes; and spikeless. Traffic was applied at two intensities (100 and 200 traverses per week) by people wearing the various shoes and walking directly back and forth across the plot, without turning on the experimental area.

Traffic was started on June 12, and finished on Sept. 5 (12 weeks). Ball-roll distances for all plots were measured with a Stimpmeter on Fridays following traffic applications.

Wear was rated on a scale of 0 to 5, with "5" being full cover and "0" being bare. A cover rating of 3 or above was considered acceptable as a putting surface. Wear was rated at eight and 12 weeks.

A second study evaluated the effects of tread type on ball-roll deflection. An area similar and adjacent to the modified root-zone area was used for one plot area and a 2-year old practice putting green at Centre Hills Country Club in State College was used for the sand plot area. The practice putting green was Penncross creeping bentgrass and no thatch layer was present.

On the modified soil plot, the metal and soft-plastic spikes (at the low-traffic intensity) and the spikeless tread (at the high-traffic intensity) were the only treatments to cause ball-roll distance to be significantly less than the control. On the all-sand plot, all treatments but the soft-plastic spikes (high-traffic intensity) caused ball-roll distance to be significantly less as compared to the control.

The wear from all tread types was acceptable on both soils at low-traffic intensities (800 total traverses) at the eight-week rating. However, at the high-traffic intensity (1,600 total traverses), all tread types caused an unacceptable amount of wear on both soil types. Conventional spikes caused the most wear, and the spikeless tread caused the least.

Wear ratings for both soil textures after 800 and 1,600 traverses.

At the 12-week rating, the wear from all treads was acceptable on the modified soil at the low-traffic intensity. Only the metal spikes and soft-plastic spikes caused unacceptable wear on the all-sand root zone at the low-traffic intensity (1,200 traverses). All tread types caused unacceptable wear on both soil types at the high-traffic intensity (2,400 traverses). Again, the spikeless tread caused the least amount of wear.

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In the test for ball-roll deflection, an average of the 10 balls rolled per traffic intensity was determined and the averages of the 10, 20, 30 and 40 traverses were compared to the average of the 0 traffic intensity. This distance was considered deviation from the control.

The only effect of tread type on ball-roll deflection was on the modified root zone at the 10-traverse traffic intensity. This difference could be attributed to the thatch layer that was present on the experimental area. There were no other effects of tread type on ball-roll deviation for any of the other traffic intensities. And the tread type by intensity interaction was not significant.

On the straight sand with no thatch layer present, the metal spikes caused the most deviation from the control. Although there was a wide range between means at some intensities, the means and the tread type by intensity interaction were not statistically different. Also, the amount of ball-roll deviation from the control should be noted for some treatments.

Wear rating for both soil textures after 800 & 1,600 traverses

Tread type	Traverses	Wear* Modified Soil	Wear* All Sand
Metal	800	3.2	2.5
Soft-plastic	800	4.2	3.5
Spikeless	800	3.8	3.7
Metal	1,600	1.7	1.3
Soft-plastic	1,600	2.2	1.8
Spikeless	1,600	2.7	2.3
Control	0	5.0	4.5
	LSD	0.4	0.5

*0= bare, 5 = full cover.> 3 = acceptable.

Inches of deviation from the control for various traffic intensities for the all-sand root zone

Tread Type	Traverses 10	20	30	40	Avg.
	inches				
Metal	4.1	10.8	12.0	12.2	9.8
Soft-plastic	5.9	7.8	4.8	4.9	5.8
Spikeless	3.8	2.0	4.0	2.2	3.0
LSD	2,8	28.9	33.3	28.1	6.0

Studies have tested various effects of golf shoes

Many types of golf shoe treads have been developed to help alleviate the damage caused by conventional metal spikes.

Some types of treads may lessen the damage to the putting surface, but at the expense of stable footing.

Only a few studies have been conducted to evaluate the effects of shoe types on turf quality and ball roll.

In 1958, reporting on a study conducted by Gipson and Potts at Texas A&M College, Ferguson reported that ripple sole and rubber cleated shoes caused significantly less damage to a Seaside bentgrass turf when compared to a shoe with conventional metal spikes.

Gibeault et al (1983) evaluated metal spikes, two different types of multi-stud soles, and suction-type cleats.

This study also concluded that metal spikes caused the most damage and the suction-type cleats caused the least.

Morrow and Danneberger (1995) evaluated the effects of metal spikes and soft plastic spikes (SoftSpikes) on ball roll. They concluded that both soft plastic spikes and metal spikes caused ball-roll distance to increase.

They also said metal spikes appeared to cause more turf damage than the soft plastic spikes, although this was not quantified.