

## TURFGRASS SOIL MANAGEMENT RESEARCH REPORT-1997

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### Golf Spike Survey

The number of golf courses that have banned metal spikes worldwide continues to grow. Table 1 gives a timeline of courses adopting a non-metal policy. The majority of the golf courses are located in the United States as the non-metal invasion is just beginning in Europe. Some of the reported golf courses simply suggest their members wear alternative spikes. In this scenario most members comply.

Table 1.

#### Number of golf courses that have banned metal spikes.\*

January 1995	January 1996	January 1997	January 1998
55	185	1300	3000+

\* Information provided by *Softspikes*®

In the spring of 1997 the Golf Association of Michigan (GAM) adopted an alternative spike policy for their events. The GAM hosts a number of amateur golf events on courses throughout Michigan. However, there was growing concern that some alternative spikes might also cause damage to putting surfaces. In response to the interest expressed by the GAM it was decided to conduct a golf spike/sole survey at the Annual Michigan Turfgrass Foundation/MSU Turfgrass Field Day.

#### Putting The Green

The survey was conducted at the Hancock Turfgrass Research Center on a two year old Penncross creeping bentgrass putting green. The site was divided into 20 greens, each measuring 6' x 15'. Beginning in May they were mowed five times per week at 5/32" with a walk behind mower. One foot wide collars, mowed bi-weekly at 3/16", separated the greens. They were put on a light frequent sand topdressing program. On August 27, the day before Turfgrass Field Day, cups were set in the middle of each green. Early the next morning the greens were mowed. Nineteen of the twenty greens had a pair of golf shoes designated for play on that particular green. The remaining green was a check plot that received no play.

All golf shoes were size 11. Sixteen pairs were Foot-Joy® DryJoys®. Each pair had a different type of golf spike inserted into them. The remaining three pairs were Etonic® Stabilites™, Etonic® Difference® with DSS-1™ Spikes, and NIKE® Zoom Air™ with the NIKE® waffle spike.

Eight individuals trafficked each green by lacing on the appropriate shoe and putting into the cup a predetermined amount of times. One hundred twenty putting rounds were simulated by the time the survey began.

#### The Survey

Participants in the Field Day were asked to rate the wear on the greens from the different spikes/shoes. The rating scale used was:

- 5 = No visible foot traffic.
- 4 = Indistinct foot traffic (very hard to see the foot traffic).
- 3 = Visible foot traffic, but acceptable wear.
- 2 = Apparent foot traffic that appears damaging.
- 1 = Would recommend banning these from the golf course.

Results of the survey are given in Table 2. Among the evaluators who did the ratings were 56 golf course superintendents, 45 assistant golf course superintendents, 34 golf course crew members, and 52 other (turf supply distributors, green committee chairs, etc.) for a total of 187 participants. The overall mean

appears in the “Combined” column. Product names are presented in descending order as the means appear in the “Combined” column. Few differences in evaluations occurred among the occupation of the evaluators and most of the differences were minimal.

Table 2. Survey of evaluations of golf spikes/soles.

	G.C. Super	Assistant	G.C. Crew	Other	Combined
Check	4.6	4.8	4.4	4.6	4.6
Etonic® Stabilities™	3.9	3.6	3.7	3.9	3.8
Green KEEPERSTM	3.8	3.6	3.6	3.8	3.7
Turfmates™	3.6	3.5	3.6	3.5	3.6
Gripper™	3.5	3.4	3.5	3.4	3.5
FLATSPIKES™	3.3	3.5	3.4	3.4	3.4
NIKE® Zoom Air™					
Waffle Spike	3.3	3.1	3.5	3.3	3.3
FLEXI-GRIP™	3.2	3.3	3.2	3.1	3.2
SoftSpikes® XPTM	3.2	3.1	3.2	3.2	3.2
TRED-LITE™ SP	3.1	3.2	3.1	3.3	3.2
Turfmates™ Plus	3.2	3.5	3.1	3.1	3.2
SOFTWALK™	3.1	3.2	3.1	3.1	3.1
Greenspike®	3.2	3.2	3.0	3.1	3.1
SoftSpikes® XT™	3.0	2.8	3.1	2.9	3.0
TRED-LITE™ MT	2.9	3.1	3.2	3.0	3.0
Etonic® Difference®					
DSS-1™ Spike	2.8	2.9	3.0	3.0	2.9
SoftSpikes®	2.5	2.7	2.8	2.7	2.7
SmartspikeSTM	2.3	2.4	2.6	2.4	2.4
6 mm metal	2.0	2.0	2.1	1.8	2.0
8 mm metal	1.2	1.2	1.3	1.3	1.2
number	56	45	34	52	187

## Results

As one might expect the check plot received the highest rating (least perceived injury). In this survey the only treatment with an average considered low enough to suggest the shoe/sole not be used was the 8 mm spike. The Etonic® Stabilities™ had the lowest noticeable wear evaluation (highest number in the table) among the trafficked greens. Alternative spikes in the survey with a metal component include Turfmates Plus™ and SOFTWALK™. Both had averages greater than “3” and even the all-metal 6 mm spike earned an overall average of “2”. Many golf clubs currently have a non-metal policy. This policy impacted SOFTWALK™’s recent decision to replace its metal retractable spike with a ceramic one.

There are several interesting points from the survey results. The first point is that most alternative spike manufacturers are continually attempting to improve their product(s). This is reflected in the survey with the Softspikes® products. Three Softspikes® products (Softspikes®, Softspikes® XT™, and Softspikes® XPTM) were included in the survey. Softspikes® was the original product and Softspikes® XPTM is the newest addition to their line. Note that with each new design the product earned a higher average on the putting surface.

Another point of interest regards the product design. Notice that had the averages been rounded-off the only non-metal spike averaging a number less than “3” would have been SmartspikeSTM. It is noteworthy that SmartspikeSTM is primarily designed for traction equal to metal spikes. Damage to infrastructure (bridges, decks, carpeting, golf carts, etc.) was also a primary concern in the design of this and other alternative spike products. While SmartspikeSTM ended up with the lowest alternative spike average the scale reflects it was not worthy of banishment from the golf course.

An alternative spike traction survey is ongoing with the MSU men’s and women’s golf teams. The traction survey was initiated in the fall and will conclude in the spring. The participants are rating traction on various surfaces under various weather conditions as they go through their practice rounds. The result of all

three surveys will be combined and reported in the summer/fall of 1998.

### GREEN SOIL MIX CULTURAL PRACTICES STUDY

During his/her career the golf course superintendent may have to maintain greens constructed with different soil types or that have received differing topdressing programs. There is a lack of data on the effect of long-term management of putting greens growing on different soils in a situation where comparisons can be made. The objective of this research is to evaluate the effects of turf management programs on turf quality and responses for greens growing on three different soils.

The study was conducted on plots established with funding from the Michigan Turfgrass Foundation in 1993. The three greens mixes are : 1) an 85% sand, 15% peat green built to U.S.G.A. specifications; 2) an 80% sand, 10% peat, 10% soil green with a perched water table ; and 3) a native soil push-up green (sandy loam-sandy clay loam) with no perched water table. There are three replications of each soil type. Each soil type section measures 60 feet by 60 feet. Furthermore, each section was split to accommodate two greens giving us a total of 18 greens. One of the two greens in each section was rolled three times/week with an Olathe roller and the other green was utilized as a check (i.e. not rolled). The grass is Penncross creeping bentgrass.

The area was mowed six times a week with a walk behind mower at a cutting height of .157 inch. Topdressing of the entire area with sand was accomplished on a light-frequent basis throughout the growing seasons. Thickness of the sand topdressing/mat layer as measured in the last 3 years is reported in Table 3. Irrigation was applied on a daily light-frequent practice with the exception of dry down periods to permit collecting data on development of localized dry spot. Pesticides were only applied on a curative basis to collecting data on any differences in disease, insect, or weed activity.

Table 3.

#### Thickness of Sand-Topdressing Layer

August 1995	October 1996	October 1997
14 mm	21 mm	27.5 mm

Traffic to simulate typical wear on putting greens was applied to the plots six times per week with a triplex greens-mower modified with spiked rollers in lieu of reel units. The rollers are 60 cm long and 20 cm in diameter. Six mm spikes are spaced at 2.5 cm intervals on the rollers. Front and rear (5 cm) rollers level each of the three traffic simulator units.

Statistically significant differences in disease pressure, insect activity, and moss and algae growth have been observed. Other interesting trends include development of localized dry spots and the appearance of black layer. The USGA constructed green has had the most dollar spot. However, data presented in Tables 4, 5, and 6 indicate the difference in dollar spot activity between the USGA and 80:10:10 mix is diminishing on non-rolled plots. In 1995 (Table 4) for rolled plots the USGA plots had more dollar spots than the 80:10:10 mix while the native soil had by far the least. On the unrolled plots the trends were similar except for the rating on September 1. In 1996 (Table 5) the same trends continued with the number of dollar spots on the 80:10:10 mix approaching those found on the USGA green only for the late season rating on August 22 when dollarspot activity was very high. This trend continued in 1997 (Table 6) with the exception of June rating when the 80:10:10 non-rolled green produced the greatest dollar spot activity. The number of dollar spots on the 80:10:10 unrolled plots approached those on the USGA green on other rating dates. Only the USGA green had high numbers of dollar spots on the rolled plots, however.

The likely reason for the higher dollar spot activity on the USGA green is the lower organic matter levels in this mix of 85% sand, 15% peat. Both sand and peat have very low nitrogen contents and would provide little nitrogen for the turf, making it more susceptible to dollar spot. The 80:10:10 mix has 10% native soil which would provide some nitrogen. The native soil green had very little dollarspot on most evaluation dates, particularly on the rolled plots.

It is hypothesized that the tendency for smaller differences in dollar spot activity between the USGA