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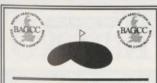
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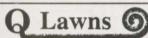
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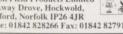
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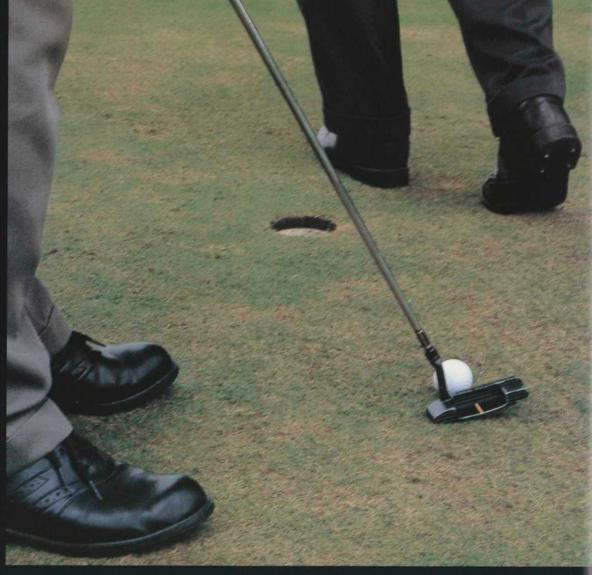
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# Wearand tear



#### Dr. Stephen Baker, Head of Soils and Sports Surface Science at the STRI, Bingley examines golf shoe design and wear on the golf course...

A study in California in 1960 found that an average golfer walks 52 paces on the green while approaching the ball, putting it into the hole and then leaving for the next tee. A modern golf shoe typically has 11 spikes and therefore it is easy to calculate the number of spike holes that golfers will make, over a given time period. During busy periods of the year, 1000 rounds of golf per week would not be uncommon on many UK golf courses. This would leave a legacy of over half a million spike holes on a single green, with an inevitable concentration of wear at the front of the green and around the pin positions. It is not surprising therefore that there is considerable interest in how different shoe types may affect the amount of wear and the quality of the putting surface.

Manufacturers, especially in the United States, are now marketing a vast array of footwear featuring alternatives to traditional metal spikes. These have sometimes been referred to as soft spikes but in the same way as Hoover (a manufacturer) and vacuum cleaner (a product) are sometimes wrongly interchanged, I will use the term "alternative spikes" to avoid confusion with the product of a single manufacturer.
In this article I intend to consider

American research on footwear design and turfgrass wear, to address various issues such as traction for the player and to consider how this work may be made more relevant to conditions in the United Kingdom.

#### Shoe design and turf wear

Early studies, dating from 1958 and 1959, carried out at Texas A&M College, were reported by Marvin Ferguson of the USGA. Initial tests consisted of individuals walking across a bentgrass putting green turf in a straight line, with damage to the turf being recorded. Conventional spikes were most damaging, rubber cleated shoes intermediate and ripple soles caused the least damage. This work was extended to include the effects of the golfer turning and changing direction, so a cup was placed in the centre of each experimental plot and players spent ten minutes per day for a five week peri-od putting the ball into the cup.

Metal spikes caused the worst turf damage and there was additional evidence that the rounded shoulder to the spikes was accentuating damage.

More research was carried out at the University of California in the early 1980s on Penncross creeping bentgrass greens. In this study, conventional metal-spiked golf shoes were compared with two shoes with multi-studded soles and a spikeless shoe with small suction-type cleats. For each shoe type, plots were 4 ft. (1.2 m) wide and 10 ft. (3 m) long and were divided into a walking area and a putting area. The area subjected to the conventional metal-spiked golf shoe had poorer colour, decreased density and a scruffy, ragged appearance. Tests by two golfers also suggested that when metal spikes were used the turf had the poorest putting characteristics. Damage from the metal spikes was still visible four weeks after the experiment was discontinued.

In a study carried out at Ohio State University, again on creeping bentgrass turf, the effects of metal spikes, soft spikes and an unworn control were compared. On three of the four assessment dates, ball roll distances were greater where soft spikes were used. The authors also observed that turf damage was less when soft spikes were used and there was greater trueness of ball roll.

More recent work from Penn State University was published in 1998. This study included an all-sand and a slightly modified (74% sand) rootzone and once more featured creeping bentgrass. The three footwear types were conventional 8 mm metal spikes, soft plastic spikes (Soft Spikes) and a spikeless design. The work indicated that "the metal spikes usually caused more wear than the other two tread types. The effect that tread types have on ball roll distance and wear appear to be directly related to the amount of sand in the rootzone and traffic intensity.

The basic findings of these studies seem to be supported by observations from STRI agronomists who have recently visited the USA as part of an exchange scheme with USGA Green Section staff. Many golf courses with a spikeless policy appear to have benefited considerably in terms of the

quality of their greens. It has to be recognised, however, that the benefits are likely to be greatest on courses receiving heavy use, or with greens with a restricted number of hole locations, or where the green is under environmental stress, for example because of the effects of shade.

Most of the research that has been carried out in the USA has been on creeping bentgrass. Most greens in the UK on the other hand tend to be a combination of browntop bent, Highland bent and annual meadowgrass, with fescue remaining on some greens. This may be important as creeping bent, because of its aboveground, lateral stolons, may be more susceptible to the plucking effect of metal studs. Research is therefore needed on the effects of shoe design on grass types more widely found on UK golf courses.

#### Other benefits of spikeless

From the greenkeeper's point of view, any factor that reduces turf damage is an advantage. This may be reflected in a reduction in the costs of maintenance for example because of reductions in the frequency of top dressing, aeration, weed control and cup changing. Furthermore, turf that is weakened by heavy use is more susceptible to disease. As a consequence, fungicides may be needed less often if turfgrass wear can be reduced.

Furthermore, it is not only the greens that may benefit from changes in footwear design - metal spikes certainly contribute to other forms of damage around the course, for example to wooden steps, bridges, artificial tee mats, golf carts and flooring materials in the clubhouse.

#### **Traction properties**

The main reason that players started using spiked footwear in the first place was they wanted to improve their amount of grip. This is relevant to both stable footing during the golf swing and when walking around the course, especially on slopes and banks. Although there is considerable evidence that alternative spikes may reduce the amount of wear, the issue of traction is equally important. This may be especially true in a country such as the United Kingdom where

golf continues through the winter months at a time when rainfall greatly exceeds evaporation. Also, in our cool climate there are long periods with little active growth.

Consequently, heavy use leaves slippery areas of mud, which may also accumulate on the soles reducing the effectiveness of some shoe types.

#### **Future research**

Research is needed on alternative spikes that is relevant to the main grass types used for golf in the United Kingdom and to consider the safety issues concerned with their use, particularly through the winter months when wet ground conditions make traction a major issue. There is also a need to look at how any progressive shortening of the spikes, as they become more worn, might affect traction properties.

Accordingly, the STRI has been working with SATRA, the research organisation concerned with footwear technology, to develop a research programme on alternative spikes. This has the main objectives of;

 Understanding the mechanisms by which different golf shoe sole designs cause turfgrass damage, particularly on greens but also elsewhere on courses and in the clubhouse.

• Determining the player's traction requirements of golf shoes and to define specific traction performance criteria both on and off the course.

- Quantifying the effects of key sole or spike design factors on performance, including number, length and sharpness of spike or cleat protuberances.
- Devising a design or specification for golf shoe soles incorporating spikes or other traction devices to maximise player performance and safety while minimising course damage.

The performance of alternative spikes is of major importance to golf greenkeepers and BIGGA have already indicated that they may be willing to contribute to the costs of the research.

Other organisations have also been approached and we are hoping that a detailed programme of work will be starting later in the year.

#### Feature listing from July '97

July '97; Royal Troon GC; Speed of Putting Surfaces; Mowers

August '97; Maintenance Facilities; Heather Management; Bunker Rakes; Workshops; Architecture; Kedleston Park GC

September '97; Accident Reporting; Greens Mowers; Valderrama GC; Links Courses

October '97; Environment; Recruitment; Abbeydale GC; Rough Mowers; Soil Analysis

November '97; Environment Competition; Bank Cutting; Risk Assessment; Pumps

**December '97;** Seed Development; Longhirst Hall GC; Toro Awards; Fertiliser Spreaders; Communication

January '98; FEGGA Conference; Buying Power Equipment; Elmwood GC; Mobile Phones; Traffic Management; Spraying; Environment

February '98; BTME Review; Overseeding; Royal Mid Surrey GC; Drainage; Thatch

March '98; Trees, Golf Course Accessories, News from GCSAA, Leamington & County GC, Trevor Smith's BTME Talk

**April '98;** Gleneagles Hotel, Compact Tractors, Environment, Protective clothing, Rain bird, Internet

May '98; Greens Mowers, Suspended Water Table Greens, Seeds, Letham Grange Resort, Charterhouse profile, Security and BIGGA's Fund Raising Campaign

**June '98;** Interview with Nick Park, Earthworm special, ATVs, Royal Porthcawl, Grinding

July '98; Aeration, Royal Birkdale preview, The importance of research, Architecture

August '98; Mill Ride, Fescue, Blowers, Textron, Open Review, Nematodes, Training

September '98; Nine holers — Tolladine and Fingle Glen, Turf, Steve Clement profile, Drainage, World Scientific Congress report

October '98; Saltex Review, BIGGA Retrospective, Stirling GC, Toro Awards Preview, Tree grants

November '98; Royal Opening, Ramside Hall GC, Gang Mowers, Hayter International report, Irrigation Systems

**December '98;** Toro Awards, Environment Awards, The Appliance of Science, Engines, Architects, BTME Preview

January '99: Pesticide Usage, Life in Colorado, Lyshott Heath GC, Worm Research, Stylo Matchmaker profile, Temporary Greens

February '99; Westerham GC; R&A questionaire results; Finland; grass cutting; BTME99 Review; Bernhard and Co

March '99; Loch Lomond, Worm update, GrassRoots, Softspikes, Maintenance facilities, Environment review, Architecture

April '99; Carden Park, Telecommunications, Water Management, Rolawn, Seeds

May '99; Security, Bude and North Cornwall GC, Spraying Regulations, Jim Arthur, The Acid Theory, Amenity Technology profile

June '99; Thorpeness GC, Millennium Bug Busting, Irrigation, Scotts profile, Company adaptability



# Critical analysis



If only we could teach the golfers to have a better understanding of the factors that affect course conditions, I am sure they would realise that the grass is not always greener on the other side.

This month I would like to change track and talk about what I believe is one of the worst problems facing many greenkeepers today, that is, course comparisons by golfers who have little understanding of turf maintenance. I have lost count of the times someone has commented about this course "is better than that" - condition wise that is - or "these greens are faster than those". These comments are fine when discussed by greenkeepers who understand the reasons and conditions, but when it is the golfer, it usually has a totally different meaning. If only we could teach the golfers to have a better understanding of the factors that affect course conditions, I am sure they would realise that the grass is not always greener on the other side.

One of the most common comparisons made is to the professional tournament courses seen on television. There has been much talk about the Augusta syndrome and I don't wish to go over old ground, but television paints an unrealistic picture to the real world. Many factors come into play, such as staffing levels, equipment, finance, but most of all the soil structure and the grasses which we have to work with

Most golfers play other courses apart from their home course. When he does he tends to see only the big picture around him, the scenery and the lax-out

the scenery and the lay-out of individual holes. Back on his own course his head drops, he has already seen the sights and now he only sees the flaws such as an occasional weed or a small disfigurement on a green so he becomes more critical. He does not understand the circumstances. Every golf course is unique and it is difficult, if not impossible, to make like for like comparisons. The amount of play and the age of the course should always be considered before making comparisons about conditions. We, the greenkeepers know, but does the average golfer?

Golfers will continue to compare one course against another, but it needs to be stressed that each course is different in so many ways. The vast majority of Course Managers/Greenkeepers consider the condition of their course a very personal issue and when unfair comparisons are made, it hurts.

The golfer is far from unique. Like most of us, he or she rarely blames themselves for playing badly. If they hit a shot out-of-bounds it's because their partner, or something moved. If a putt is missed, someone spoke or the ball jumped on some invisible object. When the ball drops short of the target, the wind suddenly got up. We

have all said and heard similar comments, but by the very nature of our jobs the greenkeepers will always be in the firing line.

It may take a long time but I believe the only way to get more understanding is through education. Educating golfers at club level is a must. I am not sure how this can be achieved, but if everyone who played knew a little more about the cost and expertise required to care for their own course, then compare the resources available, they may begin to be more tolerant.

4.7. Cold

Gordon Child

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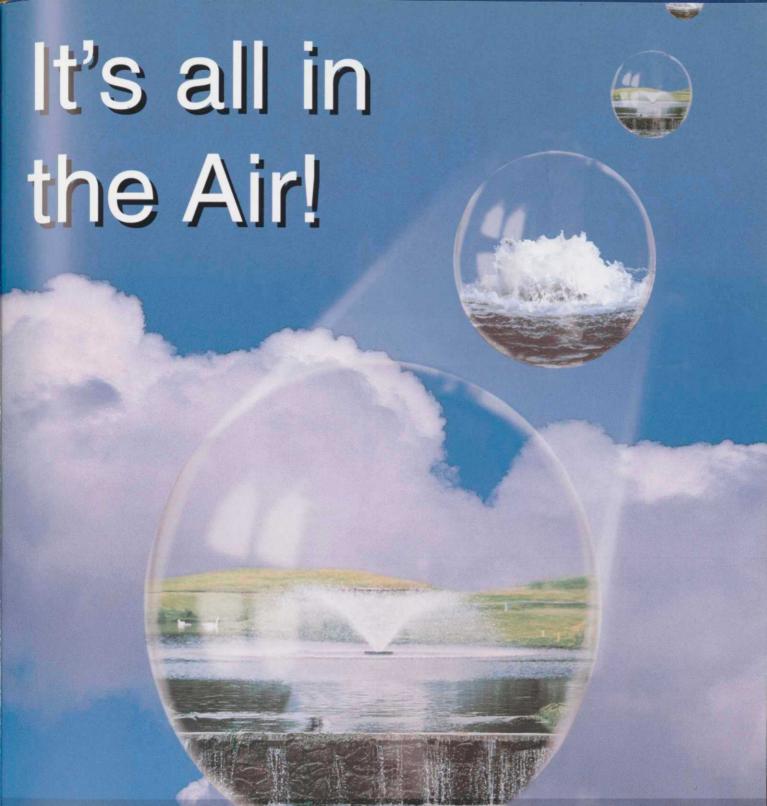
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