PERFECTLY TRUE

Fast is important, but *smooth* and *true* are, too.

BY RICHARD WINDOWS AND HENRY BECHELET

Researcher Dr. Christian Spring measures the smoothness of the putting surfaces at the 2009 Scottish Open at Loch Lomond Golf Club.

The game of golf is a test. Our job when preparing the course is to provide a good examination of the players' games. We need to present the course in a way that assesses all the various aspects of the game, with the golfer ultimately being rewarded for skilful play. We want the course to challenge the players in an interesting and enjoyable way that leaves them wanting more. We achieve this, in part, by setting up the playing surfaces in a way that rewards good play.

The greens pose a major part of the test of the game, with roughly half of all the shots being played into or on them. In general, the greens should be firm but receptive enough to reward accurate and well-struck approach shots. They need to take the ball, then release it to allow skillful shot-making from the surrounds. And of course they need to be well-paced, smooth, and true for putting. To be true to the game, they shouldn't be flattering to average play by holding poorly struck shots or those taken from the rough. So, the setup of the greens is crucially important if they are going to provide the ideal platform for play. This article concerns the perfection of the surface for putting.

WAIT FOR IT

If we are going to perfect the surfaces for putting, then we have to consider all its requirements. At present, certain golfers and greenkeepers declare that the speed of the green is all-important, with ever faster being better and nothing else matters. With such single-minded individuals, the Stimpmeter reading is king, and it seems to be used as a measure of prowess, with anything less than double figures being unsatisfactory and a sign of inadequacy. We all know this is nonsense and that faster doesn't necessarily mean better, because there's more to it than that. Of course the green speed is an important playing quality and it needs to be right, but it is not everything. There are other playing quality attributes we must also work at when setting up the perfect putting surface. Surface smoothness is equally as important as speed, and it needs to be a key consideration.

LEARN FROM THE BEST

It is always interesting to be around the top tournament professionals because they are really demanding of their greens, and with good reason because there's a lot at stake in their game. In the eyes of the true professional, the ideal putting surface comprises a combination of optimal speed, smoothness, and trueness (let's leave the firmness/receptivity for another article). The pros want the surface to provide the perfect roll for the ball in response to their super-accurate read and grooved putting stroke. For tournament play, the speed of the surface is the test of the competitor's feel and nerve, while the perfectly smooth and true roll *rewards their read*. The perfect putting surface tests the player but also gives reward for skilful play. Well-paced, smooth, and true is what the perfectionists want. It is accurate to say that the pros would sacrifice an element of speed for improved smoothness/trueness. A fair test and no complaints is all anyone wants. Smoothness is key.

HOLD ON

At present we can measure the speed of greens using a Stimpmeter, and so we can easily calculate the speed of the surface and evaluate the results. With this simple procedure we can tell the speed of the surface and decide whether it meets our requirement. Fine. The problem is that there has never been an easy or accurate way of measuring or rating the smoothness/trueness of the surfaces to give a good sight on the *quality of the roll*. We have always relied on our own perception or golfer feedback, neither of which is particularly accurate or helpful. Until now.

LADIES AND GENTLEMEN . . .

The Sports Turf Research Institute (STRI) is pleased to announce two major developments that are both aimed at quantifying the smoothness/trueness of putting surfaces. We now have a device that can accurately measure the smoothness/trueness of a surface, and we have also developed a reliable method for us all to rate the smoothness/trueness of roll. With both of these methods we can obtain an accurate reading or rating of surface smoothness/trueness to go alongside our existing measure of speed. This means that we can start accurately assessing *all* the required attributes of putting surfaces. We can form a complete picture to help guide surface preparations toward perfection.

The great thing about smoothness is that a surface simply can't be *too smooth*. This is the factor that the obsessionists might like to get stuck into in an entirely positive and non-damaging way. It might be better if we started brandishing smoothness figures around as the measure of success rather than the Stimpmeter reading.

The trueness meter is able to precisely measure the vertical and lateral deviations impacting on the ball.

THE TRUENESS METER

In conjunction with Sheffield Hallam University, and with funding from The R&A, the STRI has developed an objective measurement tool that can accurately measure the smoothness and trueness of greens. The Trueness Meter generates a reading of both the smoothness and the trueness of a putting surface.

The Meter, a trolley-like device, is pushed across the surface at a pace that reflects the speed of a ball starting a 10-foot putt. With the aid of clever electronics, a metal wheel (with the same footprint and down pressure of a golf ball) measures the amount of vertical displacement (smoothness) and lateral deviation (trueness) in terms of mm/meter. The machine is incredibly accurate and can pick up minute textural differences in the turf, the influence of *Poa annua* seedheads, the impact of maintenance treatments, wear and tear, pest and disease activity, and of course pitch marks. With this device we can accurately measure the microscopic deviations that impact on the smooth and true passage of a ball. Perfectionists lean forward.

The Trueness Meter (TM) was used during the Scottish Open at Loch Lomond and The Open at Turnberry this year to help evaluate the surfaces during practice and through the duration of each event. The results were interesting, enlightening, and helpful.

EYES OPEN

The development and use of this tool is a huge leap forward because it allows smoothness/trueness to be forensically assessed. During both events we assessed the *minute* effect of the various surface refinement operations to help inform the process of perfection. During the course of each event we could see the level of deterioration that occurred during the course of each day on individual greens and how well the surface preparations were serving to mend them and make them ready for the next day. The TM also highlighted the negative impact that overly close mowing (being undertaken to increase speed) was having on the smoothness and trueness of the greens, which supported the need for easing the mowing pressure. So, we believe this device will revolutionize tournament preparation. At present it does have its limitations because it only measures the smoothness/trueness of greens at a single point in time and, at present, it is beyond the resources of most clubs to purchase one. Maybe in 10 years it will be a standard assessment tool available to everyone. In the meantime we need another method that can provide a good measure of the surface smoothness/trueness on an ongoing basis for our down-to-earth greenkeeping.

EVERYONE IS WELCOME

To help with your ongoing surface preparation decisions, we have also developed a visual rating system to score the smoothness/trueness levels on a day-to-day basis. May we also introduce the STRI Smoothness Scale.

STRI Smoothness Scale	
Score	**Description of Smoothness/Trueness**
10	No chatter or snaking. Perfect roll.
9	
8	Predominantly smooth, but with single isolated chatter events and minimal snaking.
7	
6	Chatter dominates, with possibly single bobble events and some snaking.
5	
4	Bobbling, snaking, and chatter throughout the roll.
3	
2	Bobbling and snaking (ball bouncing around). Ball stops abruptly.
1	

Chatter = Distinct vertical vibrations discernible, but ball does not leave ground.
Snaking = Lateral deflection from intended path.
Bobble = Distinct vertical movement where ball leaves the ground.

THE SMOOTHNESS METHOD

The measurement procedure is relatively simple. All you need are a USGA-accredited Stimpmeter, three high-quality golf balls, your STRI Smoothness Scale, and of course a critical eye.

First, you select a flat part of the green (as you would when using the Stimpmeter to measure pace), run each ball down the Stimpmeter, critically analyze its roll, and give it a score in accordance with the STRI Smoothness Scale. The Stimpmeter gives a fairly standard delivery of the ball, and it positions you nicely down behind the roll for a good vantage point. To be really accurate, you may choose to get lower down on your hands and knees or even sniff the turf in front of the roll (the path to perfection always requires full commitment). Each of the three rolls is scored and then the test is repeated in the opposite direction. You then move on to a different part of the green and repeat the test in both directions. A total of 12 scores is generated, and you take the average score, which is the smoothness rating of that green (e.g., 7.2 or 6.7).

A CRITICAL EYE

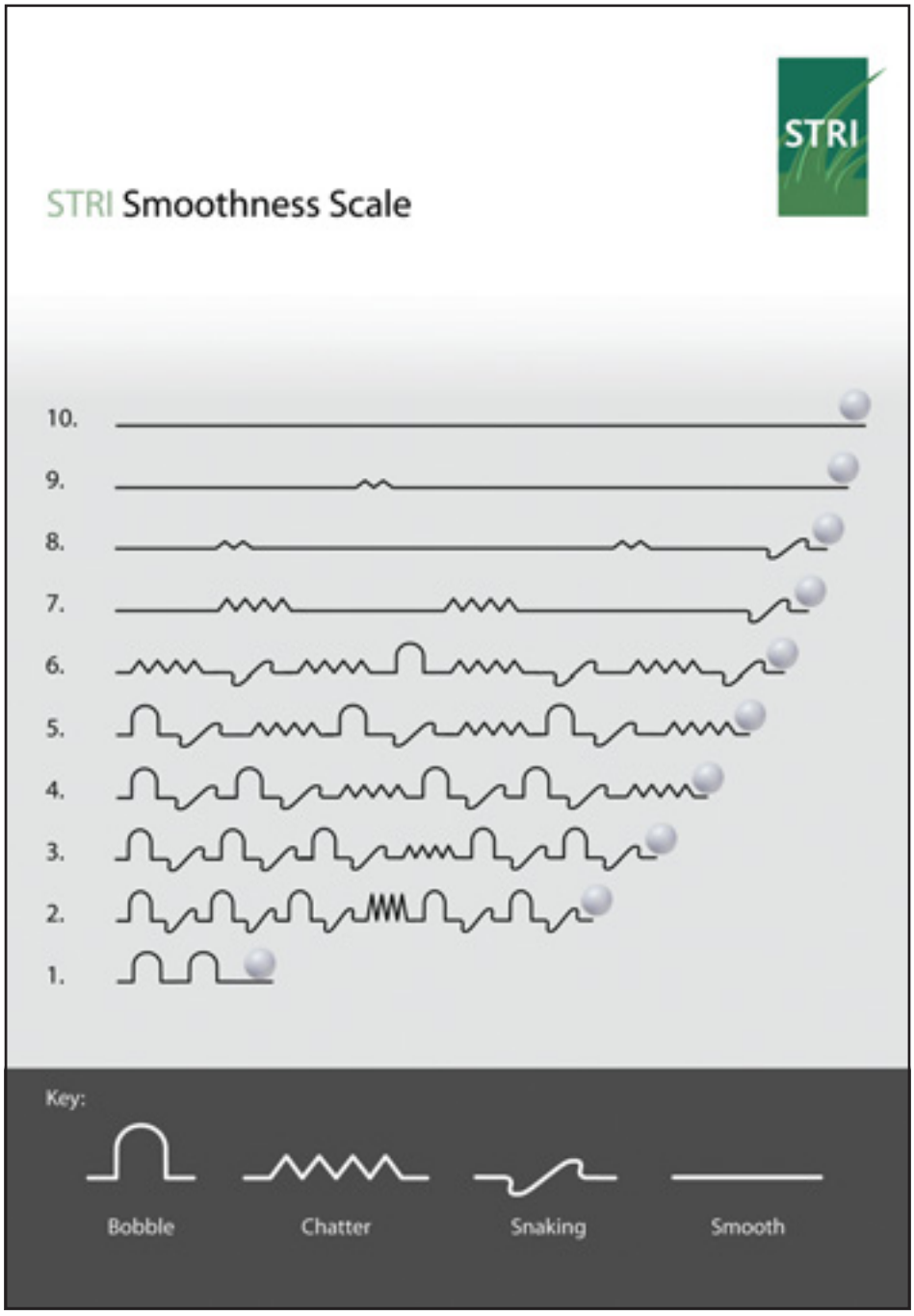
When rating ball roll, you are looking for four possible occurrences: *snaking*, *bobble*, *chatter*, and *smooth roll*. *Snaking* is the lateral deflection of the ball from its intended path (affecting the trueness). This is different from *borrow* (the compensation in a stroke for slope) and is a distinct deviation rather than a consistent borrowing arc. *Bobble* is a distinct vertical movement caused by a significant obstruction that causes the ball to leave the ground. *Chatter* is subtler than bobble and is a discernible vertical vibration/oscillation, but the ball does not leave the ground. A *smooth roll* exhibits no bobble or chatter. For each roll, you view the reaction of the ball from the surface and score it according to the rating scale (refer to Figure 1 for help).

When the roll is perfect and there is no bobble, chatter, or snaking, you score a 10. This is probably unattainable because we are dealing with a natural surface that is under constant damaging pressure from play and from the wider environment. When the surface is predominantly smooth and true, but there are occasional isolated single chatter events and some minor snaking, then score an 8. A score of 6 is dominated by chatter through the roll, but there may also be an odd bobble and occasional snaking. A score of 4 exhibits regular bobble, chatter, and some snaking. A roll dominated by both bobble and snaking, with the ball literally jumping around, merits a score of 2. Go to www.stri.co.uk for illustrative video clips.

Descriptions are given only for scores 2, 4, 6, 8, and 10 to allow some more refined scoring. For instance, if the greens are generally smooth but you also see 2-3 chatter events through the roll, then you score a 7 (better than a 6, not quite an 8). Or, if the greens are almost perfectly smooth and true but there is very minor chatter or snaking, you give a 9 (nice one). As you start developing your eye, you will also be able to differentiate further and start giving 7.5s for rolls that exhibit 2-3 "whispers" of chatter within an otherwise smooth roll (better than a straight 7, but not an 8). Once you are at this level, you really know how your greens are performing. It doesn't take long to develop your eye.

THE MEASURED APPROACH

The point of both of these assessment methods is that you now have an accurate and objective way of measuring smoothness/trueness as well as the speed of putting surfaces. In doing so, you will have a much clearer understanding of the quality of your putting surfaces. This will allow you to make better-informed decisions about your existing maintenance plan and its future direction. You can set targets for the performance of the greens throughout the year that, if achieved, will create surfaces of the desired quality. You can demonstrate when you are succeeding,



and focus your work on repairing any identified shortcomings. You can move away from the rhetoric and rely on an objective and measured method of fashioning the perfect playing qualities.

WHAT TO DO?

There are of course lots of ways in which we can work to improve the smoothness of putting surfaces. We work to create firm surfaces with a fine and dense sward by setting a good balance of mowing, verticutting, grooming, ironing, topdressing, overseeding, plant growth regulators, etc. The prevention of pest infestations, disease attack, and the development of dry patch are smoothness issues. Our task is to build a maintenance program that creates a balance that works for you to achieve your own year-round smoothness targets. Use the smoothness readings to find out what operations work and what isn't necessary. Maybe some of the more damaging treatments can be set aside because they do more harm than good. You decide. Take a look.

SUMMING UP

We will all become better turf professionals if we set our objectives, base decisions on accurate measurements, and work toward definable targets. A measure of smoothness allows you to understand the success of your surface preparations in a more complete way. The Trueness Meter is an incredibly accurate device that can help with super-refined decision making, while the STRI Smoothness Scale aims to help with your day-to-day decision making and standard setting. Being able to measure surface smoothness as well as pace, and having the ability to set specific targets to optimize the performance of greens, will help you to perfect putting surfaces. The measurements make things better by spurring positive action. To provide the best test for golfers, we need greenkeepers to test themselves. Perfectly true.

STRI's Richard Windows carefully measures the speed of a green.

RICHARD WINDOWS *and* HENRY BECHELET *are agronomists from The Sports Turf Research Institute (STRI), located in the United Kingdom. Richard is the agronomist for STRI's South Scotland Region, providing agronomic support at golf courses, bowling greens, sports pitches, and cricket grounds; and Henry is an advisory agronomist for STRI's Northeast Region.*