

Golfers' perceptions of greens speeds vary

Over typical Stimpmeter distances, golfers are only guessing when ball-roll differences are less than 6 inches.

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In 1978, the USGA gave a Stimpmeter to each member course (4) after collecting green-speed readings from approximately 1,500 golf courses in 36 states (1). These readings resulted in a reference chart for evaluating green speed during regular and tournament play (1). The USGA agonized about releasing the tables because officials believed the information might be misused and cause problems (3).

Indeed, the release of the Stimpmeter expedited tighter mowing heights and management practices such as double cutting and low fertility rates in an effort to achieve tournament

green speeds on a daily basis (3). This was not the intended use of the Stimpmeter and the green speed table, and has resulted in increased stress on golf course putting surfaces and the superintendent.

The suggested USGA green speeds are presented in the table. Note that a fast speed for regular play (8 feet 6 inches) is regarded as medium ball-roll distance for tournament play. All green speed changes are in increments of 1 foot because green speeds are considered consistent if they are within about 6 inches of each other (2). However, it has not been determined whether the



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Golfers can rarely correctly discern differences in putting speeds on greens that have a difference of 6 inches (or less) in ball-roll distance as measured by a Stimpmeter.

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Key points

- Stimpmeter use has encouraged superintendents and golfers to seek faster putting greens.
- Superintendents might be able to maximize turf health if they know how accurate golfers' perceptions of green speed are.
- While putting, most golfers are not capable of discerning the difference between the speeds of greens when differences in ball-roll distance do not exceed 6 inches, as measured with a Stimpmeter.

ability to detect changes in green speed depends on the magnitude of the original speed. That is, although the average golfer can probably detect an increase in green speed between a green that rolls 5 feet 6 inches and one that rolls 6 feet 6 inches, can that same golfer detect an increase in green speed between a green that rolls 9 feet 6 inches and one that rolls 10 feet 6 inches?

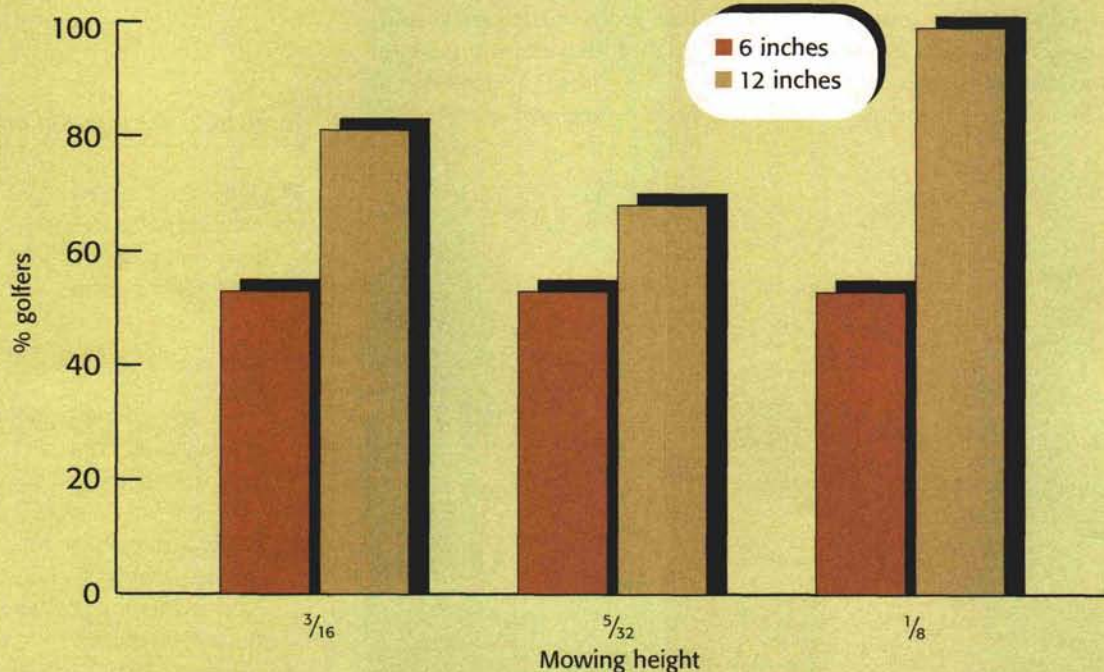
The answer to this question contains essential information that may enable golf course superintendents to manage putting greens within a range of Stimpmeter speeds that minimize turf stress throughout the growing season but maintain the greatest speed worthy of detection by the average golfer. The green speed perception study was designed to answer this question.

Experimental methods

An experimental area was established during spring 1999 on a Penncross creeping bentgrass (*Agrostis palustris*) green at the Hancock Turfgrass Research Center at Michigan State University in East Lansing. The area was divided into pairs of greens, with greens in each pair managed so that there was either a 6- or 12-inch difference in Stimpmeter speed between them. Individual greens measured approximately 3 feet by 15 feet.

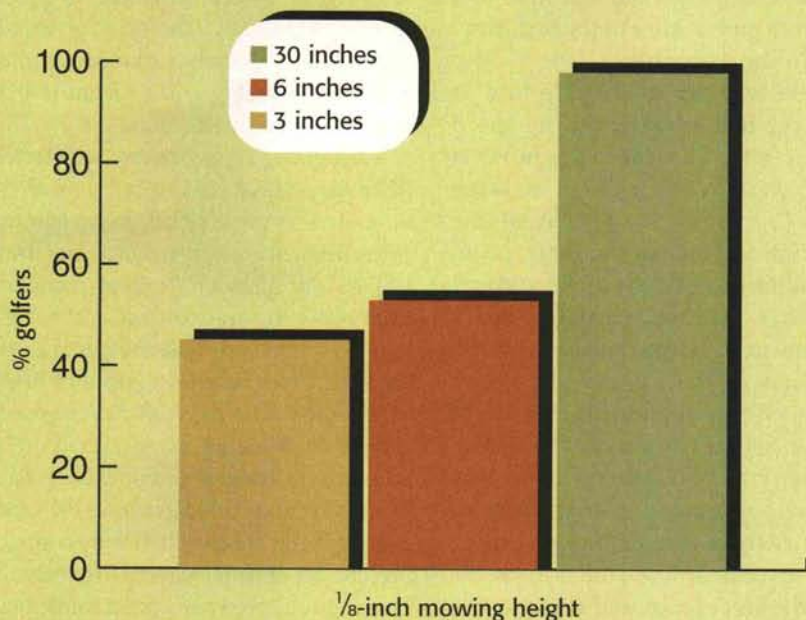
The difference in Stimpmeter speed within each pair of greens was created by rolling and double cutting the green that was intended to be faster. In addition, each pair of greens was mowed at $\frac{3}{16}$ inch, $\frac{5}{32}$ inch or $\frac{1}{8}$ inch to create a wide range of Stimpmeter speeds. Because of

50/50 accuracy



When Stimpmeter rolls varied about 6 inches, study participants couldn't correctly identify the faster green any more accurately by putting than if they'd flipped a coin. When the Stimpmeter rolls reached 12 inches, however, a greater percentage of participants identified the faster green. At $\frac{3}{16}$ inch mowing height, the 6-inch difference was 7 feet 6 inches vs. 8 feet; the 12-inch difference was 7 feet 10 inches vs. 8 feet 10 inches. At $\frac{5}{32}$ inch mowing height, greens were tweaked to produce Stimpmeter rolls of 8 feet 3 inches vs. 8 feet 9 inches, for the 6-inch difference; and 8 feet 6 inches vs. 9 feet 6 inches for the 12-inch difference. % golfers indicates the percentage of golfers who were able to correctly identify the faster green.

Big differences noted



Greater differences in ball-roll distance as measured by Stimp meter rolls produce green speed differences that are discernible by a greater percentage of golfers as they putt. The 3-inch difference was between greens Stimping at 9 feet vs. 9 feet 3 inches. The 6-inch difference occurred on greens Stimping at 9 feet 9 inches vs. 10 feet 3 inches. The 30-inch difference was between greens Stimping at 7 feet 6 inches vs. 10 feet. % golfers indicates the percentage of golfers who were able to correctly identify the faster green.

variable slope on the greens mowed at $\frac{1}{8}$ inch, a 12-inch green speed difference was not produced successfully on those greens. Instead, those greens ended up with differences in green speed of 3 inches, 6 inches and 30 inches.

Turfgrass industry professionals attending research field days at the Hancock Turfgrass Research Center volunteered to participate in the green speed perception study. Cups were cut approximately 3 feet from one end of each green, and putting areas were designated at 1 foot from the opposite end of each green. More than 30 golfers, ranging in handicap from zero to more than 30, attempted three putts on each green within a pair and were immediately asked to select the faster green.

Each golfer putted on all of the greens in the experiment. Because golfer experience or handicap was not corre-

lated with the ability to detect the faster green, the following results were averaged across all participants in the study.

Results

For any given pair of greens, if no golfers were able to detect the faster green while putting, we would still expect 50 percent of the golfers to correctly choose the faster green, purely by guessing. Therefore, percentages of 50 percent or less would reveal an inability of participants to choose correctly. From a statistical point of view, if more than 70 percent of the golfers correctly choose the faster green, we would accept the premise that they are able to detect the faster green while putting (based on the number of participants in our study).

Golfers were not able to detect the faster green, regardless of mowing height, when the difference in green

speed was 6 inches or less. Therefore, increasing putting green speeds by 6 inches or less may go unnoticed by a superintendent's golfing clientele and may cause undue stress to the turf, especially during midsummer.

Conversely, the ability of golfers to detect 12-inch differences in speed between greens depended on mowing height. At a relatively high mowing height ($\frac{3}{16}$ inch), 81 percent of the golfers correctly chose the faster green, whereas only 68 percent chose correctly at a lower mowing height ($\frac{5}{32}$ inch). Unfortunately, we were unable to detect this trend at $\frac{1}{8}$ inch mowing height because no pair of greens at that height had 12 inches difference in speed. However, it is quite apparent that golfers can detect a variation in green speed of 30 inches at the $\frac{1}{8}$ -inch mowing height, as 97 percent of the golfers correctly chose the faster green in that case.

Conclusion

From this survey it is evident that the average golfer's ability to detect variations in green speed depends not only on

the difference in green speeds, but also on the magnitude of the original green speed. The average golfer seems unable to detect a 6-inch variation in green speed, regardless of the original speed. Therefore, a 6-inch variation among greens is probably a fair definition of consistency on a golf course.

Changes of 12 inches can be detected when the original green speed is relatively slow, but they are less likely to be detected as the original green speed increases from USGA's standards for "regular membership play" to "tournament play." This leads us to conclude that changes in green speed of 1 foot have less chance of being noticed by the average golfer once speeds get above 9 inches as measured by a Stimpmeter. There were not enough data from this study to determine an exact green speed at which golfers can no longer perceive a 1-inch increase in green speed. Future green speed perception studies will examine this element more closely.

Finally, it is clear that golfers often have difficulty in detecting green speed changes during play. This is probably a result of the inherent variation in the putting stroke and the resulting variation in ball roll caused by slightly off-center putts. This explanation reinforces the perception that many complaints about putting green speed are announced following a relatively poor round of golf. ■

Acknowledgments

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USGA Stimpmeter definitions

Speeds for regular membership play

8 feet 6 inches	fast
7 feet 6 inches	medium fast
6 feet 6 inches	medium
5 feet 6 inches	medium slow
4 feet 6 inches	slow

Speeds for tournament play

10 feet 6 inches	fast
9 feet 6 inches	medium fast
8 feet 6 inches	medium
7 feet 6 inches	medium slow
6 feet 6 inches	slow