UTILIZING THE STIMPMETER FOR ITS INTENDED USE

Michael Morris, CGCS
Crystal Downs Country Club, Frankfort, MI
Thomas A. Nikolai and Kevin Frank
Department of Crop and Soil Sciences
Michigan State University

HISTORICAL SIGNIFICANCE

Stimp Meter, Stimp meter, Stimpmeter, or stimpmeter? Having observed the spelling of the instrument made to measure green speed several ways, I was determined to spell it correctly in articles I wrote. Thus, several years ago I performed a literature search and found that Eddie Stimpson, its inventor, spelled it Stimp Meter and Stimp meter in his original article *Introducing the Stimp*. This hardly clarified the matter but I figured the instruments creator always used two words therefore I followed suit.

However, when I wrote articles necessary for peer review (i.e., editing by scholars) they always corrected my spelling of the words Stimp Meter making it one word. Thus, not wanting to be labeled a non-conformist, I now spell the device as one word, which is Stimpmeter, which is the way the United States Golf Association (USGA) spells it in their *Stimpmeter Instruction Booklet*.

So what's the point? Well, simply put, it appears that Mr. Stimpson's device has always been a little bit confusing and rarely, if ever, has it been used properly. In 1937, Eddie Stimpson introduced the Stimp writing, "With a unit of measurement and a means of measuring the speed of greens well within the cost of every club there is no reason why better courses cannot work toward a **standard ideal speed for their greens**." Thus, the intent of the Stimpmeter was to provide **uniform green speeds from hole to hole on the same golf course**.

The USGA perfected the Stimpmeter, which by the way is not a meter long, in the 1970's. In 1976/77, the USGA Green Section agronomists characterized green speed on some 1,500 golf courses in 36 states with the aid of the Stimpmeter. From these observations a reference chart was developed to serve as a basis for evaluating green speed. This reference chart, and a Stimpmeter, was given by the USGA to each of its member clubs in 1978.

The reference chart has five categories of speed (Fast, Medium Fast, Medium, Medium Slow, and Slow) for two different kinds of play (Tournament and Regular) ranging from 126"-78" and 102"-54", respectively. The USGA objective was to assist golf course superintendents in achieving uniformity of their greens, "but it is **not intended for course comparisons**".

PROBLEM AND DIAGNOSIS

If Dr. Sigmund Freud were alive today, I am confident he would psychoanalyze the sexual implications of green speed naming the condition "Stimp-envy". Freud would write, "Stimp-envy is primarily exhibited in males that visit golf courses with faster green speeds than his clubs and/or watch golf on weekends and learn that the pros are playing on greens that Stimp a 13'. At this point feelings of inadequacy set-in that manifest themselves as tantrums primarily focused upon the golf course superintendent. Unfortunately, the tantrums displayed by the patient suffering from Stimp-envy too often result in turf death and subsequent dismissal of the golf course superintendent from his job. At this point the patient feels some gratification as he leaves the country club in his Corvette, however, his feeling of inadequacy will return".

Certainly, the intent of the Stimpmeter has been misplaced and the authors of this paper have decided enough is enough. With the support of the Michigan Turfgrass Foundation, Spectrum Technologies for the use of their weather stations, and the members at Crystal Downs Country Club we have begun to utilize the Stimpmeter for its intended purpose. In doing so we hope to spread the word and cure those suffering from Stimp-envy.

MATERIALS AND METHODS

The research was conducted at Crystal Downs C.C., Frankfort, Michigan. Michael Morris, CGCS, and his staff were responsible for the daily collection of Stimpmeter and environmental data. Two greens, #7 and #12, were selected for daily measurements of green speed and environmental data. A Stimpmeter was used to measure green speed at 7 a.m. and 2 p.m. each day from June 1 through August 31. A complete record of all cultural practices imposed throughout the season including irrigation, fertilization, growth regulation, topdressing, rolling, grooming, vertical mowing, and mowing height were recorded. Environmental data was recorded continually. The environmental factors measured included temperature, relative humidity, wind speed, wind direction, wind gust, solar radiation, and precipitation. A green speed perception study was conducted at the Hancock Turfgrass Research Center in the summer of 1999 (Nikolai *et al*., 2000). The survey concluded that differences in green speed of 8 inches or less were undetectable by the survey participants. For that reason, changes in green speed of 8 inches or more will be considered significant fluctuations in our research. Tissue testing of turfgrass clippings from the greens was conducted weekly to determine the nutritional status of the turfgrass. Tissue testing was conducted because changes in turfgrass vigor that can be related to nutritional status and therefore have the potential to influence green speed.

Data was analyzed throughout the season to determine variability in green speeds and if specific environmental factors or cultural practices alter green speed consistency. Linear correlation and multi-factor regression analysis was used to determine which factors are responsible for altering green speed consistency.

The objectives of the study were to:

1) Determine the right green speed for a particular course. As noted in the Stimpmeter Instruction Booklet "It is not the intention of the USGA to

attempt to standardize green speeds, which should remain up to the course officials, with the input of the superintendent, of each individual facility".

2) Use the Stimpmeter for its intended use (uniformity of green speed).

3) Determine the effect of diurnal change on green speed.

4) Determine the impact of environmental factors on green speed.

5) Attempt to maintain a consistent annual green speed.

RESULTS AND DISCUSSION

Objective 1: Determine the correct green speed for a golf course

When the issue of putting greens being "too slow" or "too fast" surfaced at Crystal Downs Country Club, two questions arose. The first question was obviously, "What is the best speed for our greens as measured by the Stimpmeter?" In order to answer this question, golfers at Crystal Downs were asked to complete a survey at the conclusion of each round. The golfers were asked to rate the green speed based on the following scale: too slow, slow/ok, ok, fast/ok, or too fast. The survey results indicated that 81% of the golfers rated the green speed as o.k. or fast/ok when speeds were between 9.5 to 10.5 feet as measured with a Stimpmeter (Figure 1). Interestingly, we also discovered that the green speed was between 9.5 or 10.5 or higher, more than 75% of the time throughout the season.

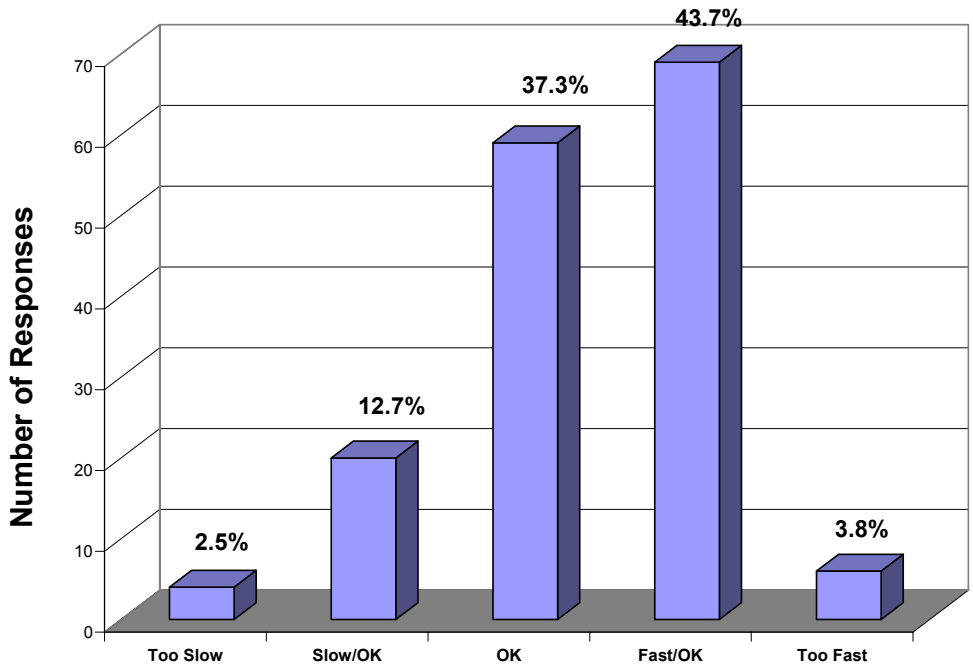

Figure 1. Golfer survey responses when green speed was between 9.5 and 10.5 feet.

Objective 2: Addressing the uniformity of green speed

The second question that arose recently at Crystal Downs Country Club was "Is it possible to maintain the greens at a consistent speed throughout the golfing season by performing consistent, routine maintenance practices?" After one year of collecting data at Crystal Downs our answer to this question is both yes and no. Figures 2 and 3 display green speed data from greens #7 and #12 from June through August at 7 a.m. and 2 p.m., respectively. It is clearly evident from the figures that there is variability in green speeds between green #7 and #12. However, on most dates the difference in green speed between the two greens is very small. Using the 8 inch difference as a measure of significance (Nikolai *et al*., 2000), for the 7 a.m. measurements there was a significant difference in green speed between #7 and #12 only 10% of the time. For the 2 p.m. measurements there was a significant difference in green speed between #7 and #12, 15% of the time. If a 6 inch difference was used as a measure of significance, the percentage of time there was a difference in green speed between #7 and #12 increases to 18 and 21% for the 7 a.m. and 2 p.m. measurements, respectively. Although the green speed between #7 and #12 differed at several times throughout the season the magnitude of the difference was rather small and in most instances would be undetectable by golfers.

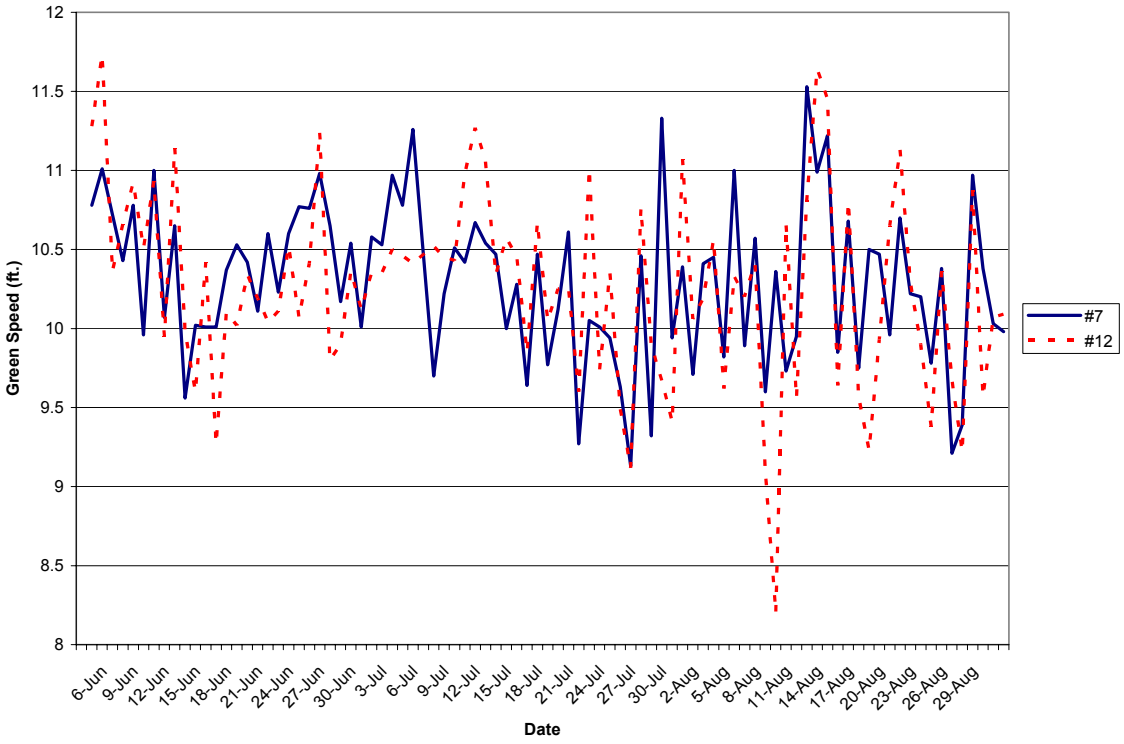

Figure 2. Green speed on green #7 and #12 from June through August as recorded at 7 a.m.

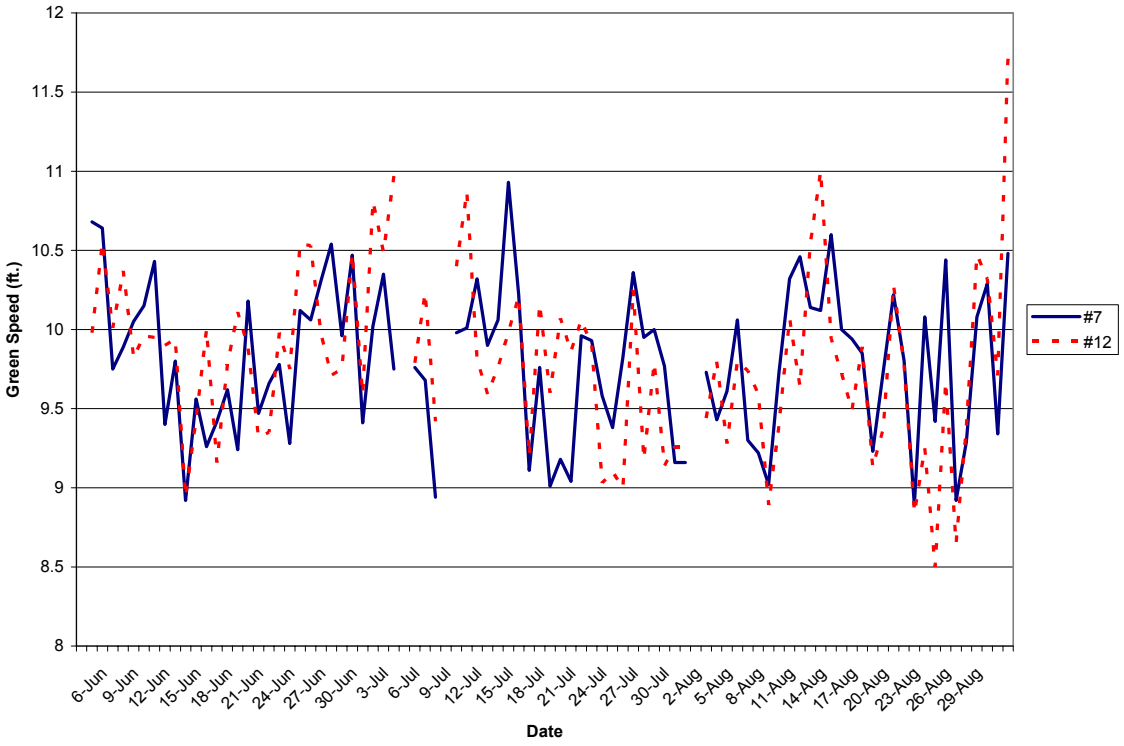

Figure 3. Green speed on green #7 and #12 from June through August as recorded at 2 p.m.

Objective 3: Determine diurnal changes in green speed

There were noticeable differences in green speed between the 7 a.m. and 2 p.m. measurements (Figure 4). For almost all measurement dates green speed was greater in the morning than in the afternoon. Using the difference of 8 inches as the indication of significance, for #7 and #12 green speed was different between 7 a.m. and 2 p.m., 22 and 26% of the time, respectively. There were only a few dates when green speed was faster in the afternoon and the percent of times this difference was greater than 8 inches was only 2 and 3% for green #7 and #12, respectively.

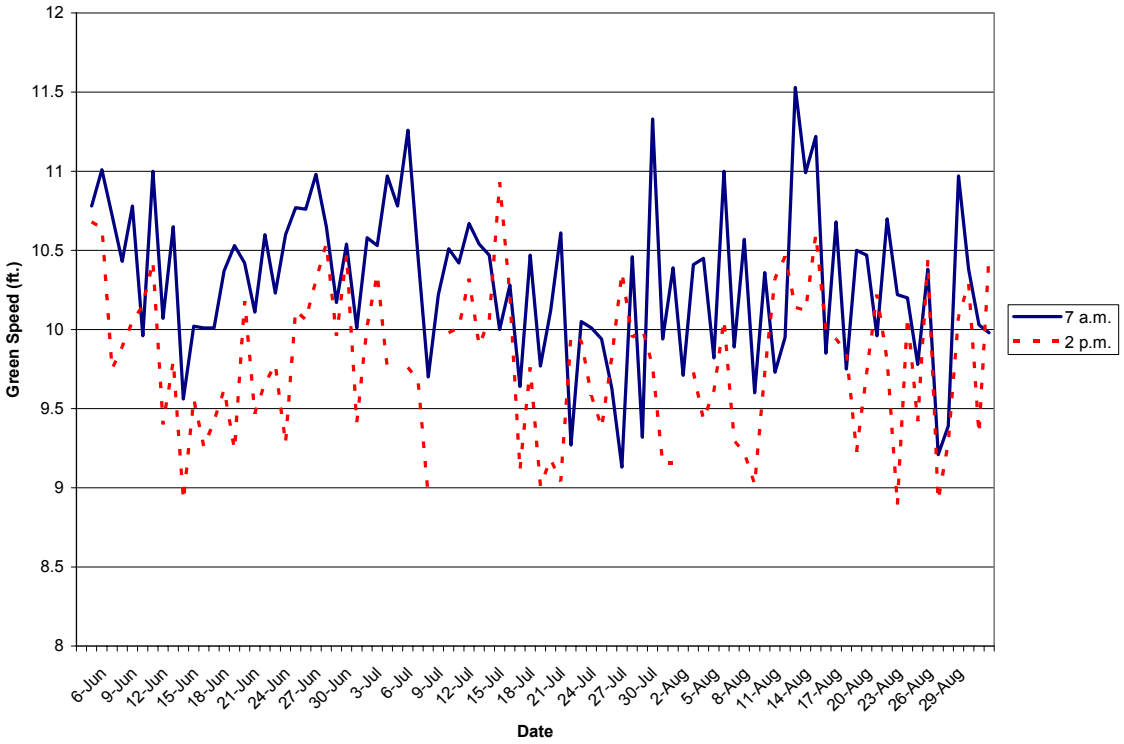

Figure 4. Green speed recorded at 7 a.m. and 2 p.m. for green #7.

Objective 4: Determine the impact of environmental factors on green speed

Environmental data was collected from weather stations positioned in close proximity to green #7 and #12. The environmental factors that were measured on a continual basis from June through August were: temperature, relative humidity, wind speed, wind gust, wind direction, rainfall, and solar radiation. Analysis of data from the first season does not indicate any discernible effects of any of the environmental factors on green speed. To date we have looked at single factor analysis of the effects of environmental data on green speed. A more complex model involving multiple factors and cultural practices will be investigated in the future to determine effects on green speed.

Objective 5: Attempt to maintain a consistent annual green speed

During the second season of this study, we will try to manipulate our cultural inputs based on environmental trends to maintain the greens in the 9.5 to 10.5 foot range on a daily basis. We hope to use the information we gather in this study to objectively arrive at and maintain a realistic target green speed or range for a particular golf course, and to use the information to educate the golfing public about the ups and downs of green speed.

CONCLUSIONS

Our initial conclusions after one year of recording green speed at Crystal Downs Country Club are the following:

- The results of the golfer survey indicated that the majority of golfers at Crystal Downs are satisfied with a green speed between 9.5 and 10.5.

- There is variability between the green speed of green #7 and #12 but the variability is small and in most instances not detectable by the golfer.

- Green speed in most instances was slower in the afternoon than in the morning.

- To date the effect of environmental factors on green speed has not been determined, further analysis is necessary.

- After completion of data analysis from Year 1, attempts will be made to modify cultural practices to maintain a consistent green speed throughout the season.