

Management Practices Affecting Bentgrass Putting Green Speed

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Putting green speed is a familiar and much discussed topic among golfers and golf course superintendents. With the introduction of the Stimpmeter in 1977 by the United States Golf Association, putting green speed could be measured rather than relying on the subjective judgments of golfers. The Stimpmeter was introduced to aid golf course superintendents in achieving a uniform speed among all greens on the course.

Unfortunately, the intended use of the Stimpmeter and the actual use are quite different. Instead of using the Stimpmeter to help achieve uniformity in speed among greens, Stimpmeter measurements are often used to force an increase in speed. The speed measured on a golf course is often compared to the guidelines established by the U.S.G.A. and to speed measured at other local courses. The prevailing opinion is that faster greens provide more of a challenge to the golfer and are better greens. Therefore, golf course superintendents are under increasing pressure to provide faster greens for play.



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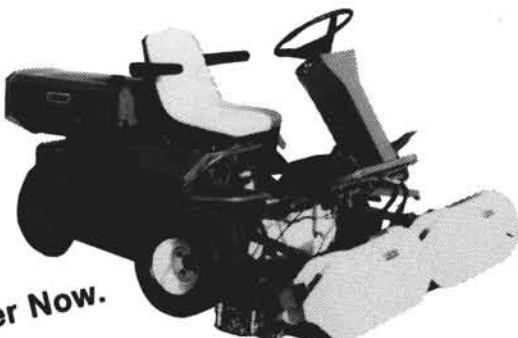
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Faster Greens are Better Greens?

Before discussing putting green management and speed we should consider the notion that faster greens are better greens. A high quality putting green will have many attributes, one of which is a reasonable putting green speed. Each golf course should decide what is a reasonable speed for the greens, based on the desires of the members, the amount of play the course receives, the money and equipment available to maintain the greens and the superintendent's knowledge and experience. In addition to a reasonable putting speed, a high quality green should be uniformly turfed and free of disruptions from disease or insects. The green should have a high shoot density of the desired species and individual leaves and tillers should be oriented vertically to eliminate graininess. Also, the green should offer some resiliency to shots played to it. Each of the attributes mentioned above contribute equally to a good golf green. To emphasize putting green speed at the expense of the other components of a good golf green would be a poor management strategy resulting in the diminished quality of the green.

With the above caution in mind we will proceed with a review of the results of a study conducted at Penn State University to determine the effect of management practices on putting green speed. All experiments were conducted on creeping bentgrass turf and speed was measured using a Stimpmeter.

Lower Cutting Height — Faster Green

Of all the factors evaluated, mowing height had greatest impact on speed. Three mowing heights, 2/32, 3/32 and 6/32 inch, were tested on a season long basis. A seasonal summary of

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speeds is shown in Figure 1. Examining Figure 1 it can be seen that as mowing height is lowered putting green speed increases. Putting green speed increased from an average of 7 feet 10 inches at 6/32 inch mowing height to 9 feet 11 inches at 3/32 inch mowing height to 10 feet 5 inches at 2/32 inch mowing height. For each 1/32 inch change in mowing height putting green speed will change by approximately 8 inches in the opposite manner. An increase in mowing height will cause a decrease in speed while a decrease in mowing height will cause an increase in speed. It is very tempting to lower the mowing height to increase putting speed. Extremely low mowing heights should be avoided. At extremely low mowing heights shoot density will decline, weed encroachment will increase and the turf will be very susceptible to any stress.

Speed Fluctuates Day to Day

Another interesting aspect of Figure 1 is the variation in putting speed from week to week. Speed will fluctuate from season to season and even day to day. These fluctuations are thought to be due to climatic and weather changes. It would be unreasonable to expect putting green speed to remain constant through an entire week, let alone an entire golfing season.

Regular mowing is an important tool in developing and maintaining a high quality putting green. Over a three month period it was found that as the number of mowings per week increased from three to seven, putting green speed also increased. However, with each increase in the number of days per week the turf was mowed the amount of the increase in putting green grew smaller. The practical significance of this is that a decrease

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in mowing frequency from 7 to 6 days a week will have a very minor long term effect on putting speed, except on the day the green is left unmowed.

Double mowing is a common and effective way to increase putting green speed for a tournament. The maximum effect of double mowing is seen after 3 consecutive days of double mowing. When comparing single vs. double mowed research plots, 1 day of double mowing increased speed 4 inches, 2 consecutive days of double mowing increased speed 6 inches and 3 consecutive days of double mowing increased speed about 8 inches. After 3 consecutive days of double mowing further consecutive days of double mowing only served to maintain the 8 inch gain in putting green speed. The day double mowing was stopped, the 8 inch gain in putting speed was lost. If double mowing is to be used to increase speed for a tournament, to achieve maximum effect, double mowing should begin 2 days prior to the start of the tournament and continued for the length of the tournament.

Added Nitrogen = Minus Speed

Nitrogen fertility management is another key aspect of putting green maintenance. When trying to decide on the proper nitrogen level, putting green speed is one of the factors that should be considered. The relationship between nitrogen level and putting green speed is that for each pound of actual nitrogen applied per 1000 square feet during the season putting green speed will decrease approximately 4 inches. The decrease in speed is due to increased growth stimulated by nitrogen fertilization. The increased growth increased resistance to a rolling golf ball, causing a decrease in putting green speed.

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Aerification and Topdressing

Aerification and topdressing are two common practices necessary for proper putting green maintenance. Each practice has a dramatic effect on putting green speed. As expected, aerification without being followed by topdressing caused a decrease in putting speed. Aerification with ¼ inch diameter tines decreased speed 2 inches and aerification with ½ inch diameter tines decreased speed 5 inches. The decrease in speed due to aerification lasted 28 days when the aerification was not followed by topdressing.

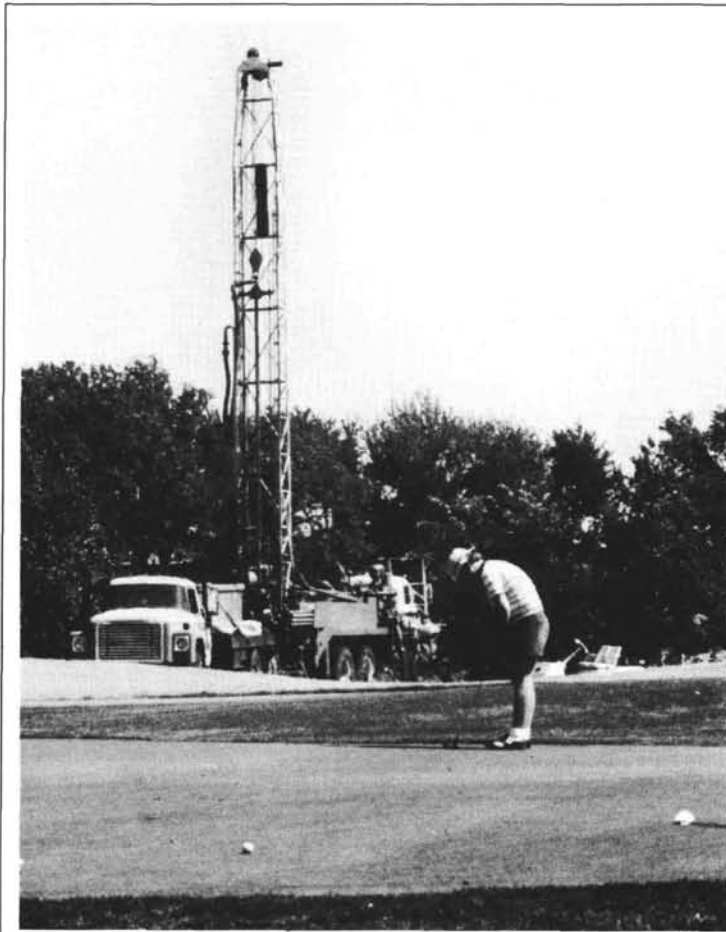
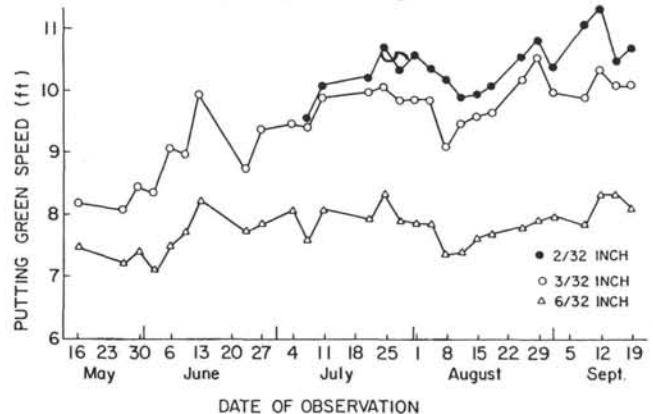
Light and heavy topdressing, following aerification, decreased speed up to 5 and 9 inches, respectively, for 8 days following topdressing. After eight days light and heavy topdressing increased speed up to 6 and 15 inches, respectively, for the next 21 days. Possible reasons for the increase in speed measured 8 days after topdressing are that it took several days for the topdressing to work through the turf canopy down to the soil surface and over the 8 day period excessive topdressing was picked up and removed by mowing.

Although aerification and topdressing initially cause a decrease in speed this does not mean these practices should be discontinued. Both aerification and topdressing are essential to maintaining a high quality putting green. The information presented here should be used to schedule aerification and topdressing operations when a short term decrease in speed will not be too disruptive to play. Topdressing is often used to increase putting speed for a tournament. If topdressing is used for this purpose schedule the topdressing application 8 to 10

days prior to the first day of the tournament so the maximum benefit of the topdressing is realized.

Some of the common management practices and their effect on speed have been discussed here. Uniform speed among all greens should be the goal of superintendents when using the Stimpmeter. If there is a demand for greater putting green speed it is important to remember that many factors affect speed and the over-all management of the greens should be designed to increase putting green speed. It would be poor management to rely solely on a single management factor to alter the speed. Although there have been on long term studies on greens managed to maximize putting green speed, it appears that most management factors that increase speed diminish the quality of turf grown on the green.

Figure 1. Seasonal variation in putting green speed measured at three mowing heights averaged over varieties.



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