MANAGEMENT FACTORS AFFECTING PUTTING GREEN SPEED

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Since the advent of the Stimpmeter and associated guideline scales for regular and tournament play, considerable attention has been focused on putting green speed. Televised tournament golf and associated media publicity have fostered both the trend and pressure for faster putting green surfaces.

To document the effects of management on speed a study was initated at Penn State; the summary of the first phase[1] reported here. "Speed" was quantitatively measured with a Stimpmeter rolling three balls in opposite directions and averaging the distances. Prior to the study of management factors, 24 golf courses in central and western Pennsylvania were tested for speed and superintendents surveyed for management practices.

1. Course speed ranges varied from 5 feet to over 10 feet, slow to exceedingly fast on the USGA scale for regular play. However, 16 courses ranged from 6-6 to 8-5, medium to fast. Speeds between greens within a course ranged from 4 to 23 inches, and speeds within a green was 6 inches or less on 48 greens and exceeding 6 inches on 31 greens. Cutting height and fertility were readily detectable variables.

Individual combination management factors were assessed in 16 different studies with the following conclusions:

1. Cutting height had the single largest impact on speed. From 2/32 to 6/32 inch mowing, a change of 1/32 inch caused an inverse speed change of 6 to 8 inches.

2. Each change in 1 pound N level per thousand annually caused an inverse speed change of 3 to 5 inches. Four foot speed differences, 7 to 11 feet, can be achieved with ranging the height of cut from 3/32 to 6/32 and annual nitrogen fertility from 1 to 6 lbs.

3. An increase in speed of 8-10 inches was measured following daily mowings. Multiple daily mowings increased speeds proportional to height of cut; greater at higher heights. Double mowings increased speed to 8 inches, and triple up to an additional 4 inches. N level had no effect on multiple mowing increase ranges.

4. Mowing frequencies per week from 3 to 7X showed a consistent variable range of slightly over 12 inches for each cutting height range with the lowest frequency the slowest.

5. Balls rolled with the direction of last mowing consistently rolled further than balls rolled against the mowing direction in multiple experiments. For 6/32, 3/32 and 2/32 cutting heights, balls rolled 6, 8 and 9 inches further, respectively, with the direction of mowing.

6. Regarding change in speed throughout the day, there was no significant difference in speed, regardless of N level, at 2 hour intervals from 0900 to 1900 hours.

7. Following imposed drought, speed decreased 4-6 inches following watering at 2/32 and 3/32, and increased 2-4 inches at 6/32 inch. Response was the same for all varieties and N levels tested.

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1 C. S. Throssell. 1981. Management Factors Affecting Putting Green Speed M. S. Thesis. Pennsylvania State University.

8. The range in speed for 36 bentgrass varieties differed by only 9 inches.

9. Aerification with 1/4 and 1/2 inch tines decreased speed 2 and 5 inches, respectively, compared to the non-aerified check. Light and heavy topdressing decreased speed up to 5 and 9 inches, respectively, for eight days following topdressing. Subsequently, speeds increased 6 and 15 inches, respectively.

10. Deep verticutting, maintenance spiking and golf shoe spike marks all decreased speed. More detailed tests are needed in this area for definite conclusions.

11. Stimpmeter readings with a limited amount of experience can be repeated with a high degree of precision. Repeatability was statistically studied at variable cutting heights and N levels. Standard error of the mean and Coefficient of Variability were always less than 0.15 and 3.0%, respectively.

It is believed that the ultimate goal of most superintendents should be to provide relative uniformity among all greens. This can be achieved, where inherent variabilities exist, by altering specific management practices. Maximizing green speed for speed sake alone should not be achieved at the expense of sacrificing acceptable turf quality. Seasonal and even daily variations in speed are not as yet completely understandable. Season long consistency is still and probably shall remain beyond the realm of a manageable biological system.