

MANAGEMENT FACTORS AFFECTING GREEN SPEED

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(INTRODUCTION) In 1983 M.G.C.S.A. provided partial funding for the research project "Management Factors Affecting Putting Green Speed". The project is being conducted at Penn State under the direction of Dr. J. M. Duich and his research assistant, Steven Langlois. Steve will be on our program at the annual conference and will speak on this project. What follows is a progress report that was issued to M.G.C.S.A. this summer.

Putting green speed continues to receive much attention because of the Stimpmeter. This instrument now allows superintendents to quantitatively measure the speed of greens in a quick simple procedure. The increase in attention has made it necessary to understand how all management practices affect green speed. This Progress Report presents results on the second phase study on management factors affecting putting green speed conducted at The Joseph Valentine Turfgrass Research Center at The Pennsylvania State University.

The study began with these objectives.

1) To learn how management factors affect putting green speed. Therefore, we designed experiments to study the effect of height of cut, watering, topdressing, verticutting, brushing and mechanical rolling.

2) To determine how the firmness of a putting surface affects speed.

RESEARCH FACILITY

The Joseph Valentine Turfgrass Research Center has approximately two acres of creeping bentgrass maintained as putting greens; one half of which is used for our study. All of the research was done on Penncross and Penneagle creeping bentgrass. The turf received preventive fungicides, 2 1/2 lbs./1000 sq. ft. of nitrogen for the year and regular maintenance watering.

RESULTS OF MANAGEMENT PRACTICES

1) We continued measuring seasonal speeds on Penncross and Penneagle creeping bentgrass mowed at 3/32", 4/32" and 6/32" six times a week. Putting green speed increased significantly from 8.0 feet to 10.0 feet as the mower was lowered from 6/32" to 4/32". However, the 3/32" cut only further increased speed approximately 4". This was not always significant and suggests that it may not be advantageous to mow that close for the additional speed. These speeds were recorded on both varieties with no significant difference between the two.

2) In July 1983, 10 rain-free days with temperatures in the upper 80's allowed us to conduct additional moisture effect on Penneagle mowed at 4/32". Water treatment received daily measured irrigation applied to provide surface saturation, whereas the non-watered was only syringed to sustain grass. The non-watered areas never exceed the watered by more than 4" over an 8-day period. These data further confirm preliminary results that withholding moisture does not substantially increase putting speed. Results are opposite the common belief that dry surfaces are faster. Wetting agent at 6 oz. per 1000 had no significant effect on speed over five consecutive days following application.

3) A fine sand, 90% remaining on a .10mm sieve, was used to study the effects of topdressing on speed. On an area mowed at 5/32" rate 1, 40 lbs./1000 sq. ft. of sand applied approximately once a week, and rate 2, 400 lbs./1000 sq. ft. of sand applied in the spring and fall, were compared to a check. The area chosen for the experiment was an 8 year stand of Penncross and Penneagle high in thatch. The sand applications on this type of surface failed to change the speed. Therefore, we decided to more effectively firm the surface. In September 1983 we heavily verticut, aerified and topdressed with sand, and the same procedures are planned for 1984.

4) Verticut and brushing treatments, alone and in combination, were applied to Penncross mowed at 6/32" and 4/32". Near weekly treatments consisted of double "nip" verticutting with a Hahn at high rpm. and/or brushing with a Bunton rotary brush. Prime interest was in the higher, 6/32", cut. At this height, the frequent light verticutting increased speed an

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average of 12" over a 10-week period, whereas brushing alone was near identical to the check. Combined brushing and verticutting was similar to just verticutting.

At 4/32", verticutting only increased speed about 3" over the control, and the combination treatment was similar. Brushing alone was slightly slower than the check for five weeks, and only slightly faster for the next five. The quality or trueness of ball roll is being studied in this test, and another on multiple varieties. It is difficult to quantify trueness of ball roll.

5) Mechanical rolling effects were studied using an "Augusta" sand box and frame weighing 70 additional pounds mounted on a Jacobsen walker mower. Treatments on Penneagle at 4/32" consisted of single and double rolling after rolling for 2 to 6 consecutive days. Single rolling increased speed from several inches to approximately a foot proportionate to number of days rolled; whereas double rolling increased from 12 to 18 inches, also proportionately. In all cases rolling effects subsided to control levels the second day after rolling ceased.

6) Quantification of firmness. It is assumed that firm green surfaces roll faster, but subjective measurements of firmness has never been achieved. Preliminary results using an Instron compression analyzer are very promising. Continuous compression at variable weight pressures appear capable of measuring just the foliar deformation, as well as thatch or other underlying materials under the canopy at higher pressures. In 1984 we plan to use this instrument to further refine firmness under various management variables, and hopefully to correlate firmness and speed.

All aspects of this year's work will be continued in 1984, as well as other variable or modifications.

WHAT DO WE DO WITH OUR RESEARCH FUNDS ?

DALE CALDWELL
MARK SMITH
CO-CHAIRMEN, RESEARCH COMMITTEE

Turf research is the foundation of the future of the turf industry.

In an attempt to create more professionalism within the Research Committee of M.G.C.S.A., policies and procedures have been changed over the past two years. Presently, various researchers are requested to submit proposals which include budgets and outlines of objectives and procedures with timetables. These proposals are discussed in committee and then funded if deemed necessary and appropriate for our area and purposes. Proposals are initially funded with a portion of the requested budget with the remainder given upon receipt of progress reports. These reports are released to the membership through the HOLE NOTES.

The following programs were funded in 1983:

- 1) Dr. Joe Vargas of Michigan State University for research on Gaeumannomyces. \$2,000.00.
- 2) Dr. J. M. Duich of Pennsylvania State University for research dealing with putting green speed. \$3,000.00.
- 3) Dr. Ward Stienstra of the University of Minnesota for research on Snow Mold control. \$1,150.00.
- 4) \$400.00 was contributed to G.C.S.A.A. for their research programs.

The following programs were funded in 1984:

- 1) The construction of a demonstration green at the University of Minnesota Golf Course. \$1,200.00.
- 2) Dr. Don White of the University of Minnesota for research on Poa annua stress management. \$3,500.00.



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