Bermudagrass Speeds

Can FAST Greens be GREEN?

Differences among varieties were significant statistically, but of small practical value

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Ball-roll distance, otherwise known as "green speed," is an important physical characteristic of putting surfaces.

By Newtonian physics, the distance a ball rolls is inversely proportional to the coefficient of rolling resistance of the surface. In our case, the surface is grass. The smoother the green, the farther the roll.

Smooth surfaces make ball-roll direction sensitive to topography and spin, factors exploited by skillful golfers who "read" the green. Close mowing generally increases greens speed, that is, reduces the friction of ball roll (*see Figure 1*).

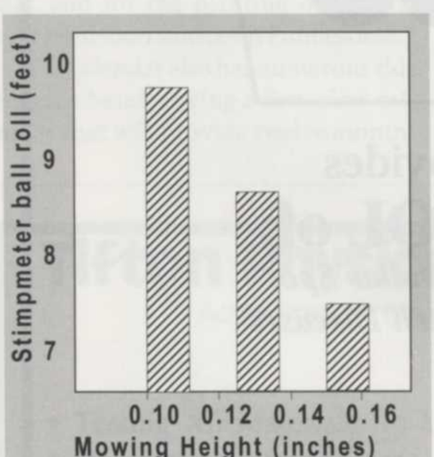


FIGURE 1. The closer the cut, the faster the ball speed, although closely mowed greens may be severely damaged. Data from Gaussoin, R., J. Nus, and L. Leuthold, 1995. A modified Stimpmeter for small-plot turfgrass research. HortScience 30:547-548.

Golf courses often reduce mowing height in preparation for tournaments and member-guest events, providing extra challenge. Drier greens also tend to be faster, but are susceptible to other problems.

Unfortunately, bermudagrass is damaged by the practices used to increase greens speed. In Florida, mowing too closely conspires with damp summer weather to bring on bermudagrass decline.

Is greens speed a grass characteristic? Are some grasses naturally "faster?"

We systematically measured and compared green speeds of 12 bermudagrass varieties. were mowed at 1/8 to 5/32 of an inch.

Bermudagrasses included commercially promising *Cynodon transvaalensis* (African bermudagrass) lines developed by Dr. Charlie Taliaferro of Oklahoma State University as well as TifEagle (formerly T-72) developed by Dr. Wayne Hanna at the USDA in Tifton, Georgia.

Tifgreen and Tifdwarf were obtained from the Georgia Seed Development Commission, managed by Dr. Earl Elsner. We thank Mr. Marcus Prevatte for managing the plots, under supervision by Dr. Monica Elliott, and with the support of the Florida Golf Course Superintendents Association.

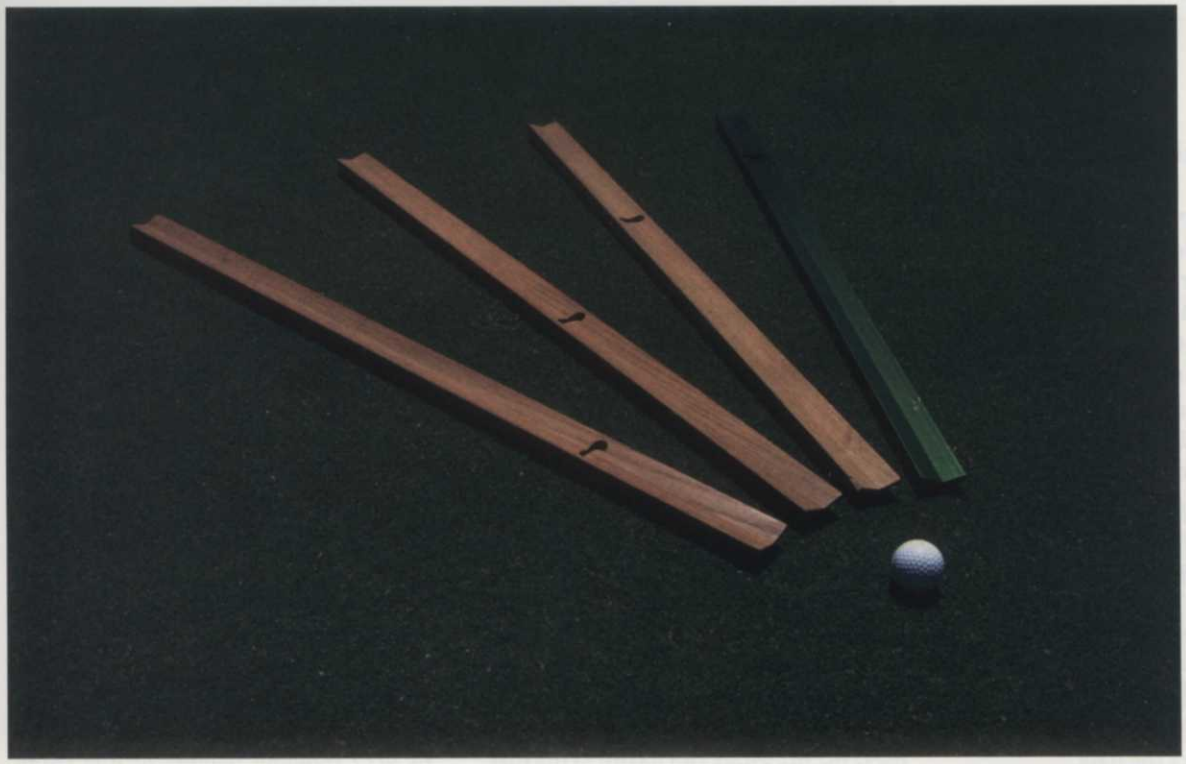
Differences in greens speed were highly significant statistically, but of small practical value (*see Table*).

For example, during the few months that Tifgreen (328) survived the close cutting, it was 4 percent slower than dwarf and ultradwarf greens types (Quality Dwarf, Classic Dwarf, and Tifdwarf). During the cool spring of 1995, when the *Cynodon trans–*

USGA Stimpmeter Estimated Ball Roll

	1995			1996			
	Feb.	Apr.	Nov.	Apr.	Jun.		
Mowing Ht (mm)	3.8	3.2	3.2	4.0	3.9	Mean	
	English						Metric
Quality Dwarf	8'5"	8'4"	10'3"	7'10"	8'1"	8'7"	263 cm
Classic Dwarf	8'4"	8'1"	10'2"	7'11"	8'2"	8'6"	261 cm
PF-11	8'5"	8'4"	9'9"	8'0"	8'0"	8'6"	260 cm
T596	8'4"	8'0"	10'0"	8'2"	8'0"	8'6"	260 cm
TifDwarf	8'1"	7'11"	9'10"	7'10"	8'1"	8'4"	256 cm
TifEagle	8'2"	7'10"	9'7"	7'10"	8'2"	8'4"	254 cm
CTR2570	8'2"	7'1"	8'11"	7'5"	7'7"	7'10"	241 cm
Tifgreen	8'1"	7'8"					
CTR3048	8'7"	7'1"	8'9"				
CTR2747	8'4"	7'2"					
CTR1111	8'3"	7'0"	8'4"				
CTR2352	8'1"	7'1"					
Mean of top six grasses	8'4"	8'1"	9'11"	7'11"	8'1"	8'5"	259 cm

Table 1. Each tabular value is based on the average of three pairs of values ("upslope" and "downslope;" see text) from four replicated plots. Estimated USGA (76-cm) Stimpmeter distances were calculated by a transformation from the value for the 19-cm Stimpmeters which we used. This is explained in the full report, Busey, P. and S.E. Boyer. 1997. Golf ball roll friction of Cynodon *genotypes. International Turfgrass Society J. 8:59-63.*



Dr. Roch Gaussoin, University of Nebraska loaned us these "modified" Stimpmeters for small plot research.

vaalensis plants were still growing healthily, they were 14% slower than dwarf and ultradwarf types.

However, the slower grasses were inappropriate for the site.

By the summer of 1995, Tifgreen and *Cynodon transvaalensis* underwent an adaptive tailspin. The combination of close mowing and moisture caused them to thin and die back. By November 1995, when the maximum speeds were recorded (10 feet 3 inches for Quality Dwarf), several *C. transvaalensis* grasses had already died out.

Ignoring the poor performance of *Cynodon transvaalensis* and Tifgreen, the range of average greens speeds of varieties was less than 4%, with TifEagle the slowest at 8 feet 4 inches and Quality Dwarf the fastest at 8 feet 7 inches.

Not much of a range!

Seasonal variations had much more effect on green speed than did grass variety. The fastest green speeds recorded in November, 1995 (based on top six grasses) were 25% faster than the slowest overall speeds recorded in April 1996.

Considering that the plots were only 8 feet by 10 feet, including alleyways, you may wonder how we were able to overcome the problem of finding sufficiently wide areas to collect the data.

This was accomplished with the help of Dr. Roch Gaussoin, University of Nebraska, who loaned us a set of shortened Stimpmeters developed by Dr. Larry Leuthold, Kansas State University, and reported in 1995 in HortScience (30:547-548) along with Dr. Jeff Nus, Golf Course Superintendents Association of America.

We used a 19-cm stimpmeter for greens speed measurement and adjusted our measurements to predict the distances for a standard 76-cm USGA Stimpmeter.

We also used the slope correction of Dr. Doug Brede, also based on Newton's laws of physics. Although there was effectively no slope in the plots, wind was unavoidable. With the slope correction and repeated sub-sampling, our coefficient of variation was extremely small, only 1.75%.

We hypothesize that rolling friction is primarily a characteristic of the compressibility of the turf canopy, which reflects the thickness and health of the turf. As an example, we also measured green speed on a RoundUp-killed plot. The ball roll was the fastest of any of our records, 11 feet 6 inches. Most Florida greens committees do not want brown greens, even though the close mowing practices to achieve speed often accomplish brown greens.

Only a few practices seem to increase green speeds without seriously compromising turf quality. They are: (1) rolling; (2) double-cutting; and (3) light, frequent topdressing. In the personal experience of one of us (S. E. Boyer), "sliming," the application of a viscous wetting agent, may help increase surface slickness and improve moisture uptake under the relatively dry conditions that seem to favor speed.

While the search for a "fast" greens variety may go nowhere, there is certainly value in using varieties such as Tifdwarf, Quality Dwarf, and TifEagle that can more-or-less withstand the 1/8 to 5/32 mowing heights of our study. Greens committees should also take a look at the Roundup "green" and realize that if you want real speed, you need something other than grass.