THE EFFECT OF PLANT GROWTH REGULATORS ON GREEN SPEED

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1992 RESEARCH SUMMARY

Golf is a game of inches, in more ways than one. Green speed is also an aspect of golf measured in inches, and unfortunately, has fueled debates between golf course memberships. Green speed is often the trademark of most reputable clubs, the faster the greens the better the course (albeit not always), and is certainly a chief means for comparisons. The following study, which was initiated in 1990, investigates the use of plant growth regulators (PGR) as a means of increasing putting green speed while maintaining quality turf.

Methods

As in previous years, the study was conducted on the campus of Michigan State University at the Hancock Turfgrass Research Center. A three year old turf stand of Agrostis palustris var. 'Pennlinks' is being used in the study. The design was a completely randomized three X five factorial with three cutting heights (0.188, 0.157, and 0.125 inch) and five PGR treatments; 0.175 and 0.25 lb ai/A flurprimidol (Dow Elanco Cutless 50 WP), 0.175 and 0.25 lb ai/A paclobutrazol (Scotts Turf Enhancer 50 WP), and a control. The area received cultural practices normally administered to greens which included; biweekly vertical mowings, one lb N/1000 sq.ft. applications per month, and two topdressings (one in June, one in July). The area was cut six times weekly with Toro Series 1000 walk behind mowers with each cutting height having a separate mower. One significant difference between this years study as opposed to previous years is that this year's study began in May with a total of five PGR treatments where as only two PGR applications were administered beginning in mid-July and August in previous years. Data collected included stimpmeter readings; (Tables 1, 2, and 3) and quality ratings; (Tables 4, 5, and 6). The quality ratings were based on a scale of 1-9 with any value under six being considered unacceptable for a putting green setting. The data were analyzed using ANOVA procedures and as shown, LSD values at the .05 level illustrate significant difference.

There were five PGR applications in 1992. The dates of those applications were: 11 May, 9 June, 15 July, 5 August, and 24 August.

Results

Stimpmeter Readings

As expected, lower cutting heights caused an increase in stimpmeter readings (Table 1) for all but one date (25 May). It took approximately 14 days following PGR treatments before stimpmeter readings were affected. Over the course of the study only one stimpmeter reading was of significant difference due to PGR treatment (11 June), (refer to Table 3). This event occurred one month following the first PGR application and two days after the second application. Compared to previous years, the results of 1992 stimpmeter readings were somewhat disappointing and perplexing since noticeable interactions had occurred in the 1991 study. It should be noted that we experienced an atypical summer with below normal temperatures and higher amounts of precipitation. The atypical summer may explain why little differences were noticed

Color Ratings

Color ratings were conducted on a weekly basis through the course of the study and are presented in Tables 4, 5, and 6. The ratings were based on color as the density was uniform throughout the study area. (The color scale was 1–9 with a rating lower than 6 considered unacceptable.) Plots cut at 0.188 inch received significantly higher color ratings than the 0.125 inch plots throughout the study (Table 4). Similar to 1991 data, initial ratings favored the check (control) plots over the PGR areas, (refer to Table 5). Nearing the end of the study the PGR treated areas began to receive equivocal or higher quality ratings than the check plots, particularly the flurprimidol treated areas. Phytotoxicity due to the PGR treatments was not observed at any point of the study.

Conclusions

PGR for increasing green speed without lowering cutting height and sacrificing quality are still a viable alternative and worthy of study. For this reason alone we plan to continue this study in 1993 at the HTRC in the exact manner in 1992.

1992 PGR/GREEN SPEED MEAN STIMPMETER READINGS

Table 1. The effect of cutting height on putting green speed, 1992–HTRC.

MOWING HT.	Stimpmeter Value (feet) Rating Dates												
	5/15	5/19	5/25	5/29	6/6	6/11	6/19	6/27	7/7	7/18	7/29	8/6	8/21
.188 inch	7.6	8.1	9.1	8.3	7.5	7.3	9.0	9.2	9.2	8.2	8.5	9.1	9.1
.157 inch	8.0	9.0	9.9	9.0	8.3	8.3	9.4	10.1	9.7	8.9	9.0	10	9.8
.125 inch	8.3	9.0	9.8	9.3	8.5	8.5	9.6	10.3	10.4	9.4	9.3	10.9	10.6
LSD (P=0.05)	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.6	0.6	0.3	0.3

Table 2. The effect of plant growth regulators on putting green speed, 1992–HTRC.

TREATMENT	Stimpmeter Value (feet) Rating Dates												
	5/15	5/19	5/25	5/29	6/6	6/11	6/19	6/27	7/7	7/18	7/29	8/6	8/21
CUTLESS .175#ai/A	8.0	8.7	9.7	8.9	8.1	8.0	9.2	9.5	9.4	8.7	8.9	9.7	9.7
CUTLESS .25#ai/A	8.0	8.8	9.5	8.8	8.3	8.0	9.4	10.1	9.9	8.9	9.1	10.3	10.0
SCOTT'S TE .175#ai/A	7.8	8.8	9.7	8.8	8.0	7.9	9.2	9.9	9.8	8.9	8.8	10.0	9.8
SCOTT'S TE .25#ai/A	8.0	8.8	9.8	9.1	8.3	8.1	9.5	10.0	10.1	9.1	8.9	10.0	10.0
CHECK	8.0	8.4	9.3	8.7	7.8	8.1	9.3	9.7	9.7	8.7	9.0	9.9	9.6
LSD (P=0.05)	NS	NS	NS	NS	NS	0.22	NS	NS	NS	NS	NS	NS	NS

1992 PGR/GREEN SPEED MEAN STIMPMETER READINGS

Table 3. The effect of cutting height and plant growth regulators on putting green speed, 1992–HTRC.

MOW. HT.	TREATMENT	Stimpmeter Value (feet) Rating Dates												
		5/15	5/19	5/25	5/29	6/6	6/11	6/19	6/27	7/7	7/18	7/29	8/6	8/21
0.188 inch	CUTLESS .175#ai/A	7.9	8.3	9.4	8.1	7.7	7.4	9.1	9.0	8.8	8.0	8.5	8.7	9.0
	CUTLESS .25#	7.7	8.2	9.1	8.5	7.8	7.6	9.0	9.5	9.5	8.4	8.9	9.3	9.2
	SCOTT'S TE .175#	7.3	8.1	8.7	8.2	7.3	7.3	8.5	9.2	9.3	8.4	8.5	9.2	9.1
	SCOTT'S TE .25#	7.6	8.4	9.4	8.9	7.7	6.9	9.3	9.1	9.6	8.3	8.2	9.3	9.2
	CHECK	7.5	7.7	8.8	7.9	7.2	7.4	9.0	9.2	8.9	8.1	8.3	9.1	8.8
0.157 inch	CUTLESS .175#ai/A	7.8	8.9	9.7	9.0	8.3	7.9	8.9	9.4	9.4	8.7	8.5	9.7	9.4
	CUTLESS .25#	8.1	8.9	9.5	8.6	8.4	8.1	9.4	10.0	9.4	9.0	9.2	10.4	10.1
	SCOTT'S TE .175#	7.9	9.2	10.5	9.2	8.3	8.3	9.5	10.6	9.9	8.8	8.7	10.2	9.7
	SCOTT'S TE .25#	8.1	9.1	9.9	9.4	8.4	8.8	9.6	10.4	10.0	9.1	9.3	9.8	9.9
	CHECK	8.1	8.8	9.7	8.9	7.9	8.3	9.4	9.9	10.0	8.9	9.2	9.9	9.8
0.125 inch	CUTLESS .175#ai/A	8.3	9.0	9.8	9.5	8.2	8.7	9.5	10.0	10.0	9.5	9.6	10.8	10.7
	CUTLESS .25#	8.2	9.4	9.8	9.2	8.6	8.4	9.8	10.7	10.7	9.4	9.2	11.1	10.7
	SCOTT'S TE .175#	8.1	9.1	9.8	9.1	8.4	8.3	9.7	9.9	10.3	9.4	9.1	10.8	10.7
	SCOTT'S TE .25#	8.3	8.9	10.1	9.2	8.8	8.6	9.7	10.6	10.7	9.8	9.3	10.9	10.8
	CHECK	8.4	8.6	9.5	9.4	8.3	8.7	9.5	10.1	10.3	9.2	9.3	10.8	10.2
LSD (P=0.05)		NS	NS	NS	NS	NS	0.2	NS	NS	NS	NS	NS	NS	NS

1992 PGR/GREEN SPEED QUALITY RATINGS

Table 4. The effect of cutting height on quality ratings, (< 6 considered unacceptable), 1992-HTRC.

MOW. HT.	5/14	5/21	5/28	6/4	6/11	6/19	6/26	7/2	7/18	7/23	7/30	8/4	8/21	9/10
0.188 inch	7.1	7.4	7.2	7.0	7.3	6.9	6.9	7.0	7.2	7.5	6.8	6.8	7.0	8.0
0.157 inch	6.2	6.5	6.4	7.0	6.9	7.0	7.1	7.0	6.8	7.7	7.0	6.7	7.5	7.8
0.125 inch	4.7	4.6	4.8	5.0	6.3	6.3	7.0	7.0	6.3	6.9	7.0	6.7	7.1	7.6
LSD (P=0.05)	0.4	0.4	0.4	0.5	0.5	0.3	NS	NS	0.5	0.4	NS	NS	NS	0.4

Table 5. The effect of plant growth regulators on quality ratings, (< 6 considered unacceptable), 1992-HTRC.

TREATMENT	5/14	5/21	5/28	6/4	6/11	6/19	6/26	7/2	7/18	7/23	7/30	8/4	8/21	9/10
CUTLESS .175#ai/A	5.8	6.4	6.2	7.0	6.7	7.0	7.3	8.0	6.8	7.4	7.3	7.1	7.2	7.7
CUTLESS .25#	6.1	6.3	6.4	7.0	6.9	6.6	7.0	7.0	6.6	7.3	7.3	6.9	7.2	7.8
SCOTTS TE .175#	5.8	5.9	5.8	6.0	6.8	6.4	6.6	7.0	6.4	7.1	6.6	6.1	7.1	8.1
SCOTTS TE .25#	6.2	5.5	5.2	5.0	6.8	6.4	6.3	7.0	7.1	7.5	6.4	6.6	7.2	7.9
CHECK	6.2	6.7	6.9	7.0	6.8	7.3	7.8	7.0	7.1	7.5	7.2	6.9	7.3	7.5
LSD (P=0.05)	NS	0.5	0.5	0.6	NS	0.3	0.5	0.6	NS	NS	0.6	0.1	NS	NS

1992 PGR/GREEN SPEED QUALITY RATINGS

Table 6. The effect of cutting height and plant growth regulators on quality ratings, (< 6 considered unacceptable), 1992–HTRC.

MOW. HT.	TREATMENT	5/14	5/21	5/28	6/4	6/11	6/19	6/26	7/2	7/18	7/23	7/30	8/4	8/21	9/10
0.188 inch	CUTLESS.175#ai/A	7.0	7.7	7.0	7.0	6.8	7.0	7.0	8.0	7.3	7.5	7.2	7.3	7.0	7.7
	CUTLESS .25#	7.0	7.8	7.7	8.0	7.3	6.7	7.2	8.0	7.3	7.8	7.7	7.7	7.2	8.3
	SCOTTS TE .175#	6.8	7.0	7.0	6.0	7.5	6.3	6.5	7.0	6.5	7.2	6.7	6.2	6.5	8.3
	SCOTTS TE .25#	7.3	6.7	6.3	6.0	7.5	6.7	6.0	7.0	7.2	7.3	5.5	5.7	7.0	8.0
	CHECK	7.3	7.7	7.8	8.0	7.2	7.8	8.0	8.0	7.7	7.7	7.2	7.2	7.3	7.8
0.157 inch	CUTLESS .175#	6.2	6.8	6.5	8.0	7.0	7.7	7.5	8.0	6.7	7.8	7.2	7.0	7.3	8.0
	CUTLESS .25#	6.3	6.5	6.8	8.0	7.2	7.0	7.3	7.0	6.3	7.5	7.3	6.8	7.5	7.5
	SCOTTS TE .175#	6.3	6.2	6.0	6.0	6.7	6.5	6.5	7.0	6.5	7.2	6.7	5.7	7.8	8.3
	SCOTTS TE .25#	6.3	5.7	5.3	5.0	6.5	6.7	6.5	7.0	7.7	8.2	6.7	7.2	7.5	8.0
	CHECK	6.0	7.2	7.2	7.0	7.0	7.2	7.7	7.0	7.0	7.7	7.2	6.8	7.5	7.3
0.125 inch	CUTLESS .175#	4.3	4.7	5.0	6.0	6.2	6.3	7.3	7.0	6.3	6.8	7.5	7.0	7.3	7.3
	CUTLESS .25#	4.8	4.5	4.7	5.0	6.2	6.0	6.5	7.0	6.2	6.5	6.8	6.3	7.0	7.7
	SCOTTS TE .175#	4.3	4.5	4.5	5.0	6.3	6.3	6.8	7.0	6.2	6.8	6.3	6.5	6.8	7.7
	SCOTTS TE .25#	4.8	4.2	4.0	5.0	6.5	5.8	6.5	6.0	6.3	7.0	7.2	6.8	7.0	7.8
	CHECK	5.2	5.2	5.8	6.0	6.2	7.0	7.7	7.0	6.7	7.2	7.2	6.8	7.2	7.3
LSD (P=.05)		NS	NS	NS	NS	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS