CURRENT TRENDS IN FERTILITY PROGRAMS FOR GOLF COURSE PUTTING GREENS

T.A. Nikolai, R.N.Calhoun, B.J. Horvath, K.W. Frank, and J.M. Vargas Jr.

Introduction

Spoon feeding programs have become the status quo for fertilization of golf course putting greens. Spoon feeding can be defined as applying small amounts of fertilizer at frequent intervals throughout the season. The objectives of spoon feeding programs are to satisfy the nutritional needs of the plant by applying light, frequent applications of balanced nutrient solutions. Additionally, spoon feeding programs are popular because they maintain control over growth, maintain consistent green speeds, and potentially improve nutrient use efficiency.

The current trend in putting green fertilization is to spray 0.1 lb. N/M every ten days throughout the growing season. This practice leads to 0.3 lb. N/M monthly. Furthermore, if the program is initiated on April 1 and ends November 1, a little over 2 lb. of N/M will be applied annually.

Materials and Methods

On April 28, 2000 a study was initiated that combined historical and current fertility practices at the Hancock Turfgrass Research Center at MSU. The study was conducted on a Penncross creeping bentgrass green that was mowed with a walk behind mower at the bench height of 0.130 inches. Irrigation was provided at 0.1" per day regardless of rain events. Light sand topdressing was applied every two weeks and the plots were verticut in weeks that topdressing was not applied. The eight treatments are outlined in Table 1.

Stimp meter measurements were taken every 5 days starting on June 1. Turfgrass quality ratings were taken throughout the study on a scale of 1 to 9 with 1 = poor, 6 = acceptable, and 9 = excellent quality.

Table 1. Fertilizer treatments

Treatment	Source	Rate/1000 ft.^{2}	Interval	Method
1.	Methex 40-0-0	1.0 lbs. N	30 days	Granular
2.	Urea 46-0-0	1.0 lbs. N	30 days	Granular
3.	14-28-10 28-7-14	1.0 lbs. N 0.1 lbs. N	April 28th 10 days	Granular Foliar
4.	6-2-0 28-7-14	1.0 lbs. N 0.1 lbs. N	April 28th 10 days	Granular Foliar
5.	28-7-14	0.1 lbs. N	10 days	Foliar
6.	Untreated			
7.	28-7-14 Primo Maxx 1EC	0.1 lbs. N 0.04 fl. oz.	10 days 10 days	Foliar Foliar
8.	Methex 40-0-0 Primo Maxx 1EC	1.0 lbs. N 0.125 fl. oz.	30 days 30 days	Granular Foliar

The objectives of the study were to determine the effects of nitrogen rates and application frequency on ball roll distance (green speed), turfgrass quality, and disease symptoms.

Results and Discussion

The monthly 1 lb. N/M treatment consistently had acceptable turf quality ratings (ie. > 6) while the check plot always resulted in unacceptable turf quality. There were no statistically significant differences in turfgrass quality between the monthly 1 lb. N/M Methex treatments with or without Primo.

The plots receiving only 0.1 lb. N/M had unacceptable turfgrass quality on all but two rating dates. However, turf plots treated with 0.1 lb. N/M that were initiated with a pound of nitrogen in the early spring or tank-mixed with Primo had acceptable turfgrass quality on most rating dates.

With respect to green speed, the 0.1 lb. N/M treatment had significantly faster green speeds than the 1 lb. N/M Methex and 1lb. N/M urea treatments throughout most of the study. On average, the 1 lb. N/M Methex and 1lb. N/M urea treatments were approximately 8" slower than the 0.1 lb. N/M treatment.

On the four sampling occasions, significant green speed differences existed between the 0.1 lb. N/M and 1 lb. N/M Methex + Primo treatments. The 0.1 lb. N/M treatment was on average 5" faster than the 1 lb. N/M Methex + Primo treatment.

There were no differences in green speed between the 0.1 lb. N/M with and without Primo. The 0.1 lb. N/M treatments that were initiated in the spring with either a 1 lb. N/M natural organic or 1 lb. N/M starter fertilizer yielded slower green speed measurements on only two and three occasions, respectively, as compared to the 0.1 lb. N/M treatment with no spring fertilizer supplement.

Stimp meter measurements of 6" are commonly accepted as the minimum difference in green speed detectable by the average golfer. For this reason green speed consistency for each treatment was estimated by determining the number of times a 6" difference or less was observed between successive measurements.

In our study there were three days that Stimp meter data were collected resulting in all treatments having greater than a 6" change in green speed. It is hypothesized that rain events were the major contributing factor resulting in the drop in green speed on all three of those dates. These three data sets were disregarded in determining consistency of green speed.

Given the criteria, the check plots had the least variation in green speed with only two observations varying by 6" or more. The 0.1 lb. N/M treatment initiated with a 1 lb. N/M starter fertilizer and the 0.1 lb. N/M treatment tank mixed with Primo resulted in the most consistent green speeds among the fertilized plots, yielding green speed variations greater than 6" on only three occasions. The 0.1 lb. N/M treatment initiated with a 1 lb. N/M natural organic and the 1 lb. N/M Methex + Primo treatment varied by 6" or more four times. The 0.1 lb. N/M every ten days had the most inconsistent green speed of any of the foliar treatments with 6 of the 14 dates resulting in green speed changes of 6" or more. The 1 lb. N/M Methex treatment and the 1 lb. N/M urea treatment varied by 6" or more 6 and 7 times, respectively.

Dollar spot data was collected twice during the study by counting the number of dollar spots per plot. No statistical significance between any of the treatments occurred regarding dollar spot. We believe this was due to the large amount of variation between plots independent of treatment. However, a general trend existed toward less dollar spot on plots receiving less nitrogen.

Conclusions

The 0.1 lb. N/M every ten days treatment without any additional nitrogen application in the spring produced unacceptable turfgrass quality. The 0.1 lb. N/M treatment also produced the most inconsistent green speeds of the four foliar treatments in the study.

Previous studies have suggested that increasing nitrogen decreases the occurrence of dollar spot. However, we noticed that low nitrogen plots had the least dollar spot, but we are not certain if this was a result of fertility regime or the inability to observe dollar spots because of an already thin, weak turf.

Both 0.1 lb. N/M turfs that were initiated with a pound of nitrogen in the spring had acceptable quality for the majority of the season and produced consistently fast green speeds. It is worth noting that the 0.04 fl. oz./M Primo + 0.1 lb. N/M treatment also produced consistent green speed and acceptable quality ratings.

Our research suggests that a spoon-feeding program should be enhanced with additional nitrogen applications in either the spring and /or the fall of each season to achieve acceptable turfgrass quality. The data suggest that the greens will not lose any noticeable speed due to supplementing with a spring feeding and that they may be more consistent for the duration of the season.

The complete results of this study will be published in a future issue of Golf Course Management.

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