

# Fertilizer Trials

Wayne R. Kussow  
Department of Soil Science

## INTRODUCTION

Two fertilizer trials were conducted this year. One addressed questions about the use of natural organic fertilizers on sand putting greens. The second trial had the purpose of evaluating the performance of three relatively new fertilizers.

## METHODS

In the first trial, three natural organic fertilizers were applied in 0.25 lb/M increments of N to 'Penncross' creeping bentgrass on a sand putting green. Three other fertilizer treatments were included for comparison purposes — one with 100% water-soluble N, one with 67% water-soluble N, and a control to which no N was applied. Re-application of the fertilizers was based on turfgrass color. A total of 1.0 lb N/M was applied between 5 June and 11 August. Routine maintenance practices consisted of mowing six times per week at 0.156 inch, daily irrigation at the previous day's ET rate, and application of fungicides to control dollar spot. The plots were rated for color on a weekly basis using the standard scale of 1 to 9.

Treatments in the second trial consisted of eight fertilizers and an unfertilized control. The fertilizers were applied once on 22 August at the rate of 0.5 lb N/M to a degraded Kentucky bluegrass–fine fescue fairway and a creeping bentgrass–Poa annua fairway. The two sites were mowed three times per week, the Kentucky bluegrass–fine fescue at    inch and the bentgrass–Poa at    inch. Irrigation was three times per week, replenishing the water lost via ET. The plots were rated for color on a weekly basis using the standard scale of 1 to 9.

## OBSERVATIONS

### Sand Putting Green

Color responses of the creeping bentgrass on a sand green to the five fertilizers applied are given in Table 1. Sixteen days after the first 0.25 lb N/M application, Gro-Power 5-3-1 with its 100% WSN was the only fertilizer that had induced a significant color response. By mid-July, treatment differences were much more numerous. Gro-Power continued to provide the most intense color, followed by Creekwood 4-5-4 and then by Isotek 18-3-16, while bentgrass color in Milorganite and Nature Safe treatments was not significantly greater than in the unfertilized plots. In mid-August, all fertilizers were providing better color than the unfertilized control and there were no differences among Creekwood 4-5-4, Nature Sate 8-3-5, Gro-Power 5-3-1, and Isotek 18-3-16.

Average color ratings for the duration of the study revealed that all fertilizers had significantly improved bentgrass color as compared to the unfertilized treatment (Table 1). Based on these average color ratings, the fertilizers can be separated into three groups. Darkest color was achieved with application of Gro-Power. In the second group were Creekwood and Isotek, while Milorganite and Nature Safe provided the least amount of color.

Table 1. Color responses of creeping bentgrass on a sand green to four 0.25 lb N/M applications of fertilizers made between 5 June and 11 August 2000.

Fertilizer applied	Bentgrass color rating			Average
	21 June	10 July	11 August	
Creekwood 4-5-4	6.16 ab†	6.77 b	6.60 a	6.64 b
Milorganite 6-2-0	6.27 ab	6.00 d	6.17 b	6.31 c
Nature Safe 8-3-5	6.17 ab	5.80 d	6.50 a	6.28 c
Gro-Power 5-3-1	6.40 a	7.47 a	6.67 a	6.98 a
Isotek 18-3-16	6.30 ab	6.37 c	6.47 ab	6.50 bc
None (control)	6.07 b	5.80 d	5.57 c	5.92 d

† Values followed by the same letter are not significantly different at the 5% probability level.

### Fairways:

The three recent entrants into the turf market that were tested are a UHS Signature fertilizer, Lange's AgricoTurf II, and Spring Valley's "Topcutt" 6-1-0 with BioKote. The UHS Signature fertilizer has Nitroform and Nutralene as its primary N carriers and, of the N present, 11.5% is water-soluble and the remainder slow-release N. The AgricoTurf II fertilizer applied contained urea coated with two chemical compounds — one that slows the conversion of urea-N to ammoniacal N and the second compound that is a nitrification inhibitor. The anticipated results are less volatilization loss of N and less N loss via leaching and/or denitrification and an increase in nitrogen use efficiency by turfgrass. The third fertilizer of recent introduction is Spring Valley "Topcutt" 6-1-0 with BioKote. This is a biosolids-based fertilizer and the function of BioKote is to alter microbial release of the organic N. Several other commercial turf fertilizers and a non-fertilized control were included for comparison purposes.

The data in Table 2 show color ratings taken one week after application of the 0.5 lb N/M. These ratings characterize the rate of turfgrass green-up. Isotek 18-3-16, with 67% of its N being water-soluble, provided the greatest initial increase in turfgrass color at both sites. The least amount of early color enhancement was obtained with UHS Signature 15-0-30 and Spring Valley 6-1-0. Good color change was achieved with Creekwood 4-5-3 and Milorganite, albeit significantly less than with the Isotek fertilizer.

The second set of color ratings presented in Table 2 were taken 6 weeks after fertilizer application to characterize the longevity of turfgrass color response. The Isotek 18-3-16 and Nature Safe 8-3-5 provided more intense turfgrass color at that time than any of the other fertilizers. This was true on both sites. The lowest color ratings after 6 weeks were those resulting from application of UHS Signature 15-0-30 on the bentgrass–Poa annua fairway and application of Creekwood 4-5-3 on the Kentucky bluegrass–fine fescue fairway.

Table 2. Color responses of bentgrass–Poa annua and Kentucky bluegrass–fine fescue fairways to fertilizers applied at the rate of 0.5 lb N/M on 22 August 2000.

Fertilizer applied	Color ratings					
	<u>Bentgrass–Poa annua</u>			<u>K. bluegrass–fine fescue</u>		
	Wk 1	Wk 6	Average	Wk 1	Wk 6	Average
UHS Signature 15-0-30	6.10de†	5.83cd	6.28d	6.30cd	6.43bc	6.70c
Lange AgricoTurf II 24-0-24	6.30cd	6.47b	6.86b	6.43c	6.63bc	6.98c
Creekwood 4-5-3	6.90b	6.23bc	6.80b	6.13de	6.37c	6.86d
Milorganite 6-2-0	6.97b	6.57b	6.89b	6.03e	6.67b	6.70c
Spring Valley 6-1-0 { with BioKote }	5.93ef	6.30b	6.44c	6.00 e	6.43bc	6.37f
Harmony 9-2-0	6.50c	6.47b	6.76b	5.93e	6.43bc	6.71e
Isotek 18-3-16	7.50a	7.47a	7.65a	8.00a	7.50a	7.88a
Nature-Safe 8-3-5	7.53a	7.33a	7.53a	7.23b	7.30a	7.60b
None (control)	5.77f	5.80d	5.98e	5.33f	5.83d	5.82g

† Values followed by the same letter are not significantly different at the 5% probability level.

Color ratings averaged over the 6-week duration of the trial showed that Isotek 18-3-16 had consistently produced the greatest amount of turfgrass color development (Table 2). The lowest average color ratings resulted from applications of UHS Signature 15-0-30 to the Kentucky bluegrass–fine fescue fairway and application of the UHS product, Milorganite, and Harmony 9-2-0 to the bentgrass–Poa annua fairway.

Because of the time of year that this trial was conducted and its duration of only 6 weeks, conclusions regarding the performance of the three new fertilizers is tentative. The UHS Signature fertilizer was characterized as being a very slow-release N product. The AgricoTurf II fertilizer performed well on both sites, but without inclusion of a pure urea treatment in the trial, it was impossible to judge whether or not there were significant reductions in volatilization and denitrification losses of N. Treating the Milorganite-based Spring Valley 6-1-0 with BioKote appeared to have reduced the rate of N mineralization as compared to Milorganite alone.