

1976 TURFGRASS SOILS REPORT - NITROGEN CARRIER EVALUATIONS  
LONG-TERM FERTILITY EFFECTS, AND WETTING AGENTS

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Several nitrogen carriers were applied to a Penncross and Emerald creeping bentgrass putting green on sand at Traverse City. The treatments were applied as outlined in Table 1. All plots received 6 pounds N per 1000 sq ft per year but were divided in either 6 one-pound N applications or 3 two-pound applications. The 45-0-0 is urea; 33-0-0 is ammonium nitrate; Milorganite is a sewage sludge from the Milwaukee Sewerage Commission; UF is ureaformaldehyde (38-0-0); UF-fine is a powdered form of ureaformaldehyde; the sulfur-coated urea is a straight nitrogen carrier (32-0-0) and a complete fertilizer (20-5-10) from Canadian Industries Limited; IBDU is isobutylidenediurea (31-0-0) from Swift's. There were 6 replications of each treatment (3 replications on each grass).

There were no apparent differences in the response to fertilizers observed on Penncross or Emerald so all results were averaged from the 6 replications. Although the dry applications of urea and ammonium nitrate resulted in slightly better quality ratings than the foliar applications the differences were very small and were attributed to a minor lack of uniformity of application of the foliar treatments. All the foliar applications were irrigated after treatment to reduce foliar burn.

All carriers except ureaformaldehyde gave good responses. As observed in previous Michigan studies the regular ureaformaldehyde does not give a full response especially during the first few years. Note that the powder form of UF performed well by the July observation date and continued well throughout the remainder of the season. The sulfur-coated urea resulted in good overall quality ratings.

In a comparison of foliar and dry applications of ammonium nitrate and urea at Traverse City the dry applications gave slightly better results although differences were small and not meaningful (Table 2). The difference was due to the lack of uniform response since the equipment used did not adapt well to the shape of the plot, thus the liquid fertilizer was not applied as uniformly as the dry application. In all cases there was no meaningful difference in turf response between ammonium nitrate and urea when the turf was irrigated right after fertilizer application. The 1975 study showed that the ammonium nitrate caused significantly more foliar burn than urea when applied at the same nitrogen rate.

In 1971, plugs of Poa annua were planted into a Merion Kentucky bluegrass sod at East Lansing and mowed at 3/4 inch. Treatments (3 replications each) shown in Tables 3 to 6 were initiated in 1972. In October, 1976 density counts were obtained from each plot. The objective was to evaluate the effects of fertility programs on the competitive ability between the two grasses.

Higher annual nitrogen rates and high spring nitrogen treatments have resulted in more Poa annua (Table 3). There has been considerable encroachment of Poa trivialis into certain plots especially those treated with Milorganite. When the counts of volunteer Poa trivialis and bentgrass were disregarded the percentage of Poa annua in the plots treated with 8 pounds N as Milorganite per 1000 square feet annually had over 90% Poa annua. The plots receiving an August treatment of ammonium nitrate had about the same amount of Poa annua as the untreated checks. This would suggest that either the nitrogen was not used as effectively

Table 1. 1976 TRAVERSE CITY NITROGEN CARRIER STUDY ON A PENNCROSS AND EMERALD BENTGRASS PUTTING GREEN. All plots received a total of 6 lbs N per 1000 sq ft for the year. Treatments were initiated in mid-May.

Carrier	Treatment		Visual Quality Rating*				
	Form	Frequency	Jun. 21	Jul. 21	Aug. 18	Sep. 9	Ave.
45-0-0	Dry	2 Months	2.3	1.5	2.5	1.9	2.0
45-0-0	Dry	Monthly	2.3	1.4	2.7	2.4	2.2
45-0-0	Foliar	2 Months	2.7	1.4	2.8	2.1	2.2
45-0-0	Foliar	Monthly	2.3	2.3	2.8	2.7	2.5
33-0-0	Dry	2 Months	3.1	1.8	2.9	2.0	2.4
33-0-0	Dry	Monthly	2.9	1.6	2.8	2.8	2.5
33-0-0	Foliar	2 Months	2.8	1.8	3.0	2.3	2.5
33-0-0	Foliar	Monthly	2.8	2.3	2.6	2.9	2.7
Milorganite	Dry	2 Months	2.8	1.9	2.9	2.5	2.6
Milorganite	Dry	Monthly	2.5	2.7	2.2	3.0	2.5
UF	Dry	2 Months	4.0	2.9	2.8	2.9	3.2
UF	Dry	Apr-Aug	3.0	4.1	3.3	2.9	3.3
UF - Fine	Dry	2 Months	3.6	1.8	2.2	2.8	2.6
UF - Fine	Dry	Apr-Aug	2.6	3.5	2.5	2.2	2.7
S-coated urea (32%)	Dry	2 Months	1.9	1.3	2.8	2.1	2.0
S-coated urea (32%)	Dry	Apr-Aug	1.4	3.0	2.9	1.4	2.2
S-coated (20-5-10)	Dry	2 Months	1.7	3.1	2.6	1.8	2.3
S-coated (20-5-10)	Dry	Apr-Aug	1.0	2.8	2.0	1.0	1.7
IBDU	Dry	2 Months	2.8	2.3	2.5	2.9	2.6
IBDU	Dry	Apr-Aug	1.9	2.9	2.8	2.4	2.5

\* 1 = Best

Table 2. 1976 NITROGEN APPLICATION STUDY ON KENTUCKY BLUEGRASS at Traverse City.  
 NITROGEN WAS APPLIED IN MAY, JUNE, AND AUGUST AT THE RATES SHOWN.  
 Averages for 3 replications

CARRIER	N RATE lbs/1000 sq ft	METHOD OF APPLICATION	VISUAL QUALITY RATING (1=Best)				
			Jun 24	Jul 21	Aug 18	Sep 9	Avg.
33-0-0	1	Foliar	3.5	3.0	3.5	3.0	3.3
45-0-0	1	Foliar	3.8	3.0	3.8	2.8	3.4
33-0-0	2	Foliar	1.5	1.5	2.0	1.2	1.6
45-0-0	2	Foliar	1.7	1.5	1.8	1.0	1.5
33-0-0	1	Dry	3.2	2.7	3.3	2.8	3.0
33-0-0	2	Dry	1.0	1.0	1.5	1.0	1.1
45-0-0	2	Dry	1.0	1.0	1.2	1.0	1.1
NONE			7.8	9.0	9.3	9.0	8.9