Bentgrass Response To Dormant Applied Milorganite —

(Continued from Page 29)

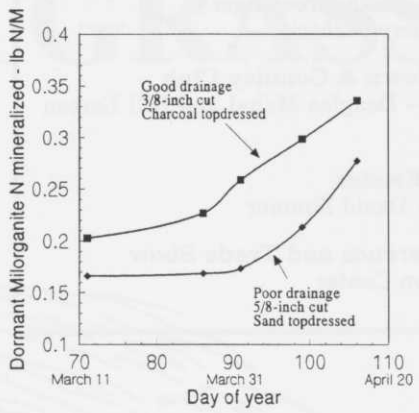
Mineralization of Dormant Applied Milorganite

Among the three treatments imposed, surface drainage had the greatest and most consistent influence on the amounts of Milorganite N mineralized during winter and the first 41 days following snowmelt on March 5, 6 and 7. As anticipated, N mineralization was greatest on the site with good surface drainage. Influences of height of cut did not become apparent until about April 1, when somewhat more mineralization was observed at the ⅜-inch cutting height than at the ⅝-inch height. The effects of the topdressings on Milorganite N mineralization were variable over time. As a general rule, topdressing with charcoal resulted in as much or more N mineralization as did topdressing with sand or soil.

The influences of surface drainage, height of cut and color of the topdressing material applied on Milorganite N mineralization were found to be additive. Therefore, mineralization was greatest on the site with good surface drainage in plots mowed at ⅜-inch and topdressed with charcoal. Conversely, N mineralization was slowest on the site with poor surface drainage on plots mowed at ⅝-inch and topdressed with sand. The magnitude of the differences in Milorganite N mineralization between these best- and worst-case situations is indicated in Figure 1.

Soil temperatures did not rise above freezing until March 16, which was 9 days after completion of snowmelt. Yet, by March 12, 0.16 to 0.21 lb/M of dormant applied Milorganite N had already been mineralized (Fig. 1). This is evidence that mineralization did occur between the time of application of the dormant Milorganite on November 23 and the time of snowmelt. The fact that soil freezing occurred 4 days after November 23 suggests that this mineralization took place primarily during the

Fig. 1. Effects of surface drainage, height of cut and topdressing material on the mineralization of dormant applied Milorganite.

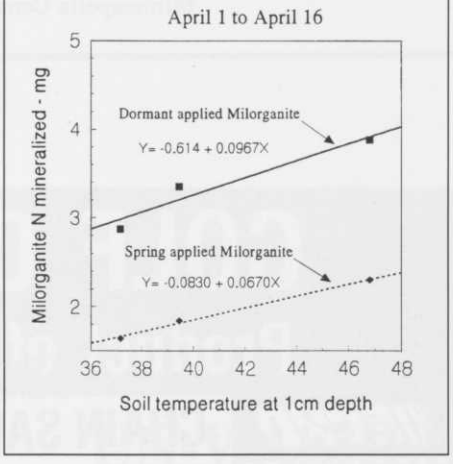


winter under the generous snow cover on the plots. It is of interest to note here that due to this deep and continous snowcover, soil temperatures at the ½-inch depth never dropped below 25 degrees. On a percentage basis, over-winter mineralization of the dormant Milorganite amounted to 10.5 to 12.3% of the N applied.

Rates of dormant Milorganite N mineralization increased noticeably between April 1 and April 16 (Fig. 1). This was a period during which daily average soil temperatures steadily increased from about 38 to 47 degrees.. By April 16, the amounts of dormant Milorganite mineralized ranged from 0.27 to 0.33 lb. N/M. It was at this time that there was sufficient regrowth of the bentgrass to begin clipping collection.

Unlike earlier in the season, between April 1 and 16 there was a linear relationship between Milorganite N mineralization rates and soil temperatures. This condition presented the opportunity to address another question I hoped the study would help answer. The question is, "Does the overwintering of Milorganite affect its springtime mineralization rates?" This is where analysis of the packets placed in the plots right after completion of snowmelt on March 7 came into the picture. By fitting equations to the mineralization of the dormant and spring applied Milorganite during this time frate (Fig. 2), I was able to derive rates of mineralization. These were 0.0967 mg N/degree rise in temperature for the dormant applied Milorganite and 0.0670 mg N/degree for the spring apllied Milorganite. What this suggests is that as soil temperatures rose, the rate of mineralization of dormant applied Milorganite was 43% faster than for spring applied Milorganite.

Fig. 2. Rates of mineralization of dormant and spring applied Milorganite.



Bentgrass Greenup

Regrowth of the bentgrass shoots commenced on or about March 28, when mean daily soil temperatures were in the range of 34 to 36 degrees. Periodic color ratings then served to characterize the effects of the study variables on greenup. As in the case of dormant Milorganite mineralization, the rate of greenup was fastest where there was good surface drainage, the grass had been mowed the previous fall at ⅜-inch, and it had been topdressed with charcoal (Fig. 3). Slowest greenup was where surface drainage was poor, the mowing height was ⅝-inch and the turf was topdressed with sand. However, differences in greenup between these "best" and "worst" sets of conditions disappeared by April 20. While they persisted, the best and worst condition differences in spring greenup amount to about one week in terms of how long it took to achieve the same level of color development.

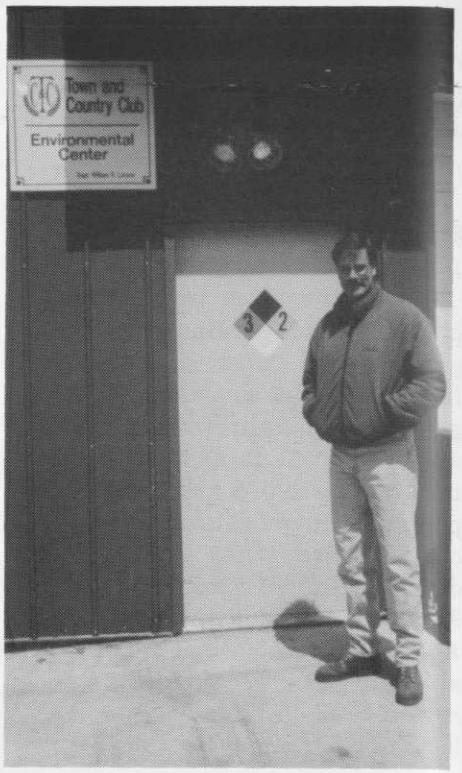
Bentgrass Clipping N

Nitrogen concentrations in clippings

(Continued on Page 35)

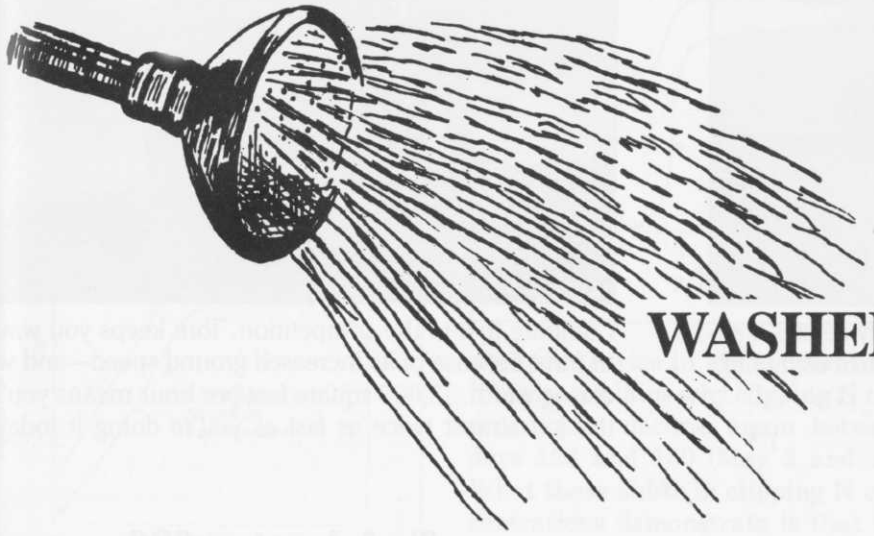
1995 MGCSA MONTHLY MEETINGS

August 14	**Baker National Golf Course** Host Superintendent – Keith Greeninger *(MGCSA Amateur Championship)*
Sept. 11	**Minikahda Club & Town & Country Club** Host Superintendents – Douglas Mahal and Bill Larson *(Stodola Scramble)*
October 9	**Chisago Lakes Golf Estates** Host Superintendent – David Zimmer
Dec. 6, 7 & 8	**MTGF/MGCSA Conference and Trade Show** Minneapolis Convention Center



BILL LARSON stands beside his Environmental Center. He, along with Doug Mahal, will offer tours of their pesticide storage and rinse pad facilities during the Stodola Scramble on Sept. 11.

BENTGRASS SOD



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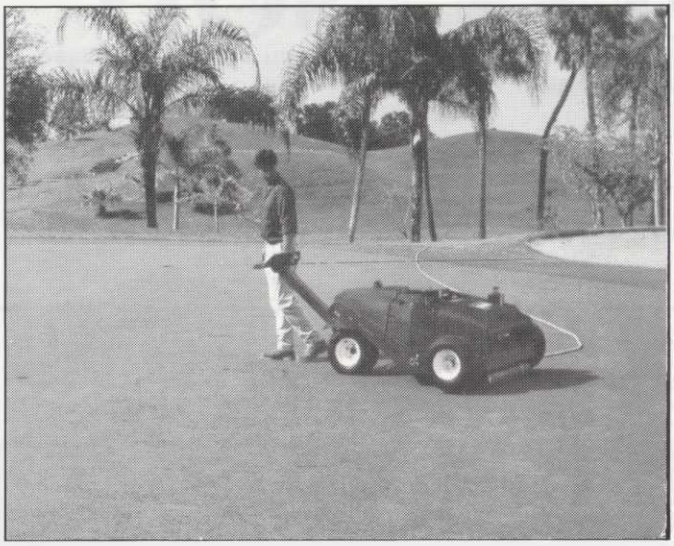

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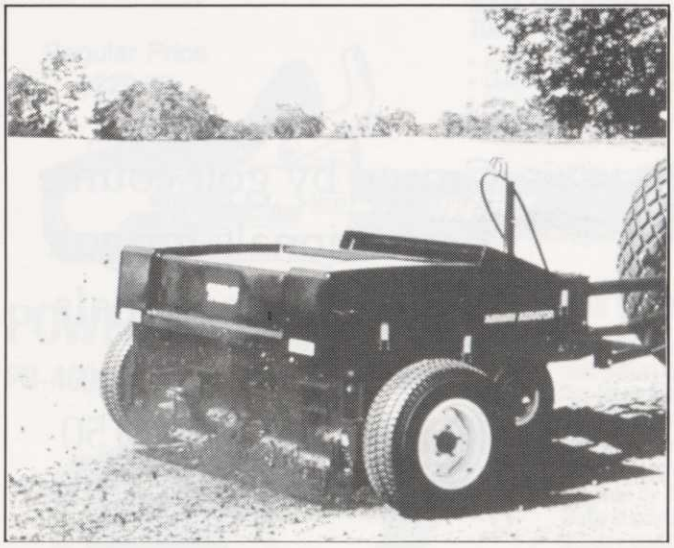

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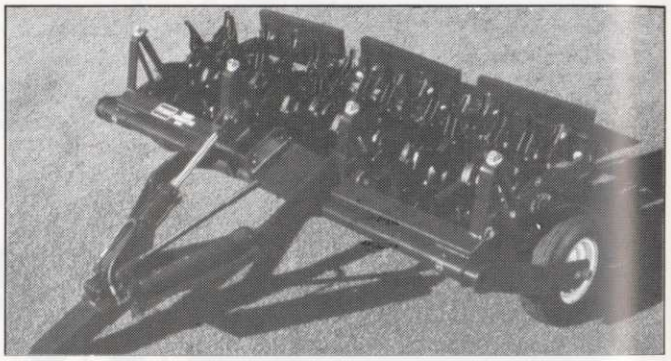

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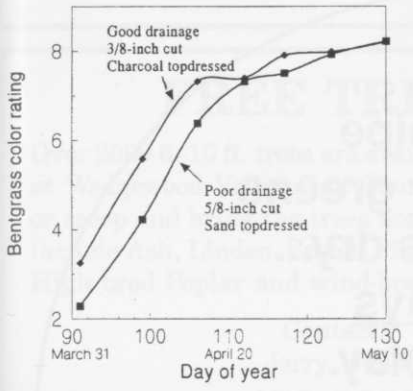
Bentgrass Response To Dormant Applied Milorganite —

(Continued from Page 31)

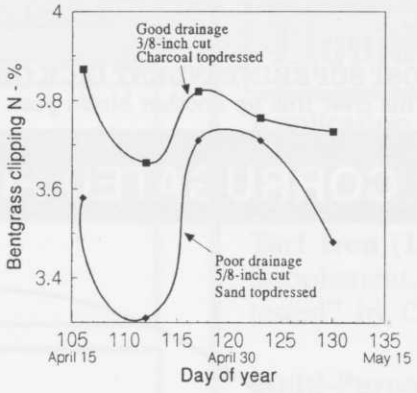
collected on April 15 (Fig. 4) reflected very nicely treatment influences on dormant N mineralization (Fig. 1) and on bentgrass color (Fig. 3). Differences in clipping N between the best and worst conditions for dormant

Fig. 3. Effects of surface drainage, height of cut and topdressing material on bentgrass color in the spring following application of dormant Milorganite.



Milorganite mineralization persisted throughout the sampling period of April 15 to May 10. This difference, however, varied from one sampling to another. This is believed to reflect variations in the bentgrass shoot growth rates. During the 5 days leading up to collection of clippings on day 112, air temperatures averaged nearly 10 degrees higher than in the 5 days leading up to the 106-day sampling and reached 85 degrees on day 110. This sudden and brief warm spell greatly stimulated shoot growth and, due to a dilution effect, may well account for the sharp reduction in clipping N concentrations between these two dates. Over the third and fourth clipping collections, air temperatures returned to more normal April values of around 50 degrees, shoot growth slowed, differences in clipping N concentrations increased, and differences between the best and worst conditions for Milorganite N mineralization declined. A rise in air temperatures likewise explains why clipping N concentrations increased, and differences between the best and worst conditions for Milorganite N mineralization

Fig. 4. Effects of surface drainage, height of cut and topdressing material on the N concentrations of bentgrass clippings in the spring following dormant Milorganite application.



declined. A rise in air temperatures likewise explains why clipping N concentrations decline again between days 123 and 130 (May 3 and 10). What these shifts in clipping N concentrations demonstrate is that the influences of surface drainage, mowing height and topdressing material on dormant applied Milorganite N mineralization are greatest during periods of rapid bentgrass growth.

Summary

The first-year results of this study provide evidence that microbial mineralization of organic N in dormant applied Milorganite can occur during winter and the N released stimulates spring greenup of creeping bentgrass. The amounts of N mineralized over the winter months averaged 0.18 lb N/M, or about 11% of the N applied. Early spring mineralization of dormant applied N is influenced by anything that affects soil temperature. In this study, surface drainage was more important in this regard than was height of cut the previous season or color of topdressing material.

The influence of these three factors were found to be additive. When good surface drainage was combined with a ⅜-inch mowing height and charcoal topdressing, spring greenup of the bentgrass prior to April 20 was approximately one week ahead of greenup in bentgrass growing on a poorly drained site, mowed at ⅝-inch, and topdressed with sand.

From these observations we can begin to enumerate conditions or reasons why turfgrass springtime response to dormant applied Milorganite is variable from site-to-site and year-to-year. Extent of snowcover is likely to be one such condition. Early and complete snowcover such as we experienced in the winter of 1993 prevents soil temperatures from falling to very low values and could well affect the extent of winter mineralization of dormant applied Milorganite. Anything that slows soil warming after snowmelt will also delay Milorganite mineralization. Frequent rains following snowmelt keeps soils wet and significantly slows soil warming, primarily because this keeps soil heat capacity high, but also because of reduced solar radiation. Poor soil drainage, surface or internal, has a similar effect. Of lesser importance is the color of the turf surface as modified by mowing height the previous fall or application of light-colored topdressing material. Barring a cold wet spring, perhaps the most important factor of all is timing of the application of dormant Milorganite. Mineralization of organic N does appear to be significant at soil temperatures around 40 degrees and certainly at temperatures in the range of 40 to 50 degrees. Two or more weeks of soil temperatures in this range after application of dormant Milorganite could well lead to sufficient microbial release of organic N to elicit a rapid rate of turfgrass greenup the following spring.

—Grass Roots

Acknowledgement

This study was made possible by a generous grant from the Milorganite Division of the Milwaukee Metropolitan Sewerage District.

Ed Zylka Retires, Bob Frank Replaces Him as Toro Rep

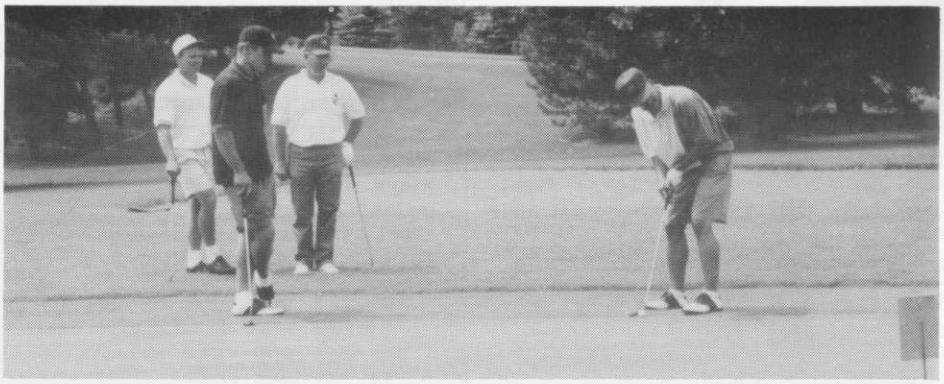
Ed Zylka, who has been a Toro representative for nearly 20 years, has decided to sit back, get out his fishing pole and enjoy his retirement.

"We wish Ed a happy and healthy retirement." said Glenn Rasmussen, MTI Distributing Co.

Rasmussen also noted that "MTI Distributing Company is growing, and we're making some changes to accommodate this growth. One of the changes is a new sales representative for Turf/Commercial equipment."

He's Bob Frank, who is replacing Ed Zylka in this capacity.

"Bob has traveled the area for many years and comes to MTI with many years of customer contact, servicing and sales experience," Rasmussen said. "He is looking forward to meeting all of you and the opportunity to assist you with your turf maintenance responsibilities."



HOST SUPERINTENDENT DICK GRUNDSTROM, Indian Hills G.C., helps some of his crew line up another birdie putt.

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EDITOR'S CORNER

By Tom Johnson
New Richmond Golf Club

What a fine turnout for the **Garske Scramble** at Indian Hills and Stillwater C.C. Hats off to **Dick Grundstrom** and crew, **Marlin Murphy** and crew for two well-conditioned golf courses. Every superintendent who has hosted a monthly meeting thinks they're being scrutinized. There are no secrets, I imagine, when those familiar with course maintenance play golf and see how a particular course is maintained. That understanding means an appreciation for the skills needed in being a golf course superintendent. We are fortunate to see the golf course through the eyes of a golfer *and* turf manager. All those who have hosted a monthly meeting deserve our thanks, understanding and appreciation. Good job!

* * * *

Par Aide has once again donated $1,000 to the scholarship fund. Like so many of the associates, **Steve Garske** has given a great deal of time and support to the MGCSA. As Steve might say, "Best Regards."

* * * *

It Could Be Worse. Although we have experienced a cold spring, some 90° temps, high humidity, weather related turf loss, dry conditions, all in all, *things could be worse.* Do you remember reading the book entitled *It Could Be Worse* to your children? No matter what problems the children had, their Grandpa would say, "It could be worse." We all take our jobs and ourselves too seriously at times and occasionally things don't go as smoothly as we would like.

Ninety-nine percent of the time things *could be worse,* and that simple statement should be part of our mangerial philosophy.

* * * *

New Research Center and Golf Course. The development of the Rosemount site is getting closer to reality. The MGA, MTGF, U of M, plus others are moving ahead with the project. Several people involved in getting this project off the ground will be visiting turf research facilities in different states — sort of a fact-finding trip. Right now it looks as if over $10 million will be available to develop this complex. Any updates will be in *Hole Notes.*

* * * *

MGCSA's good friend, **Dr. Ward Stienstra,** underwent surgery awhile ago. He's doing fine, but unfortunately, all his hair turned gray. (I should talk!).

* * * *

The members of the MGCSA make this a terrific organization. In this month's issue of *Hole Notes,* we find out some background information about **Rob Panuska** and three of the student members.

* * * *

With all this commotion over hard hats lately, here is a story about how wearing one did some good. One of the people who works for the company that plants and maintains flowers at Indian Hills was hit on the head with a ball. Not familiar with golf lingo, she didn't know what *'fore'* meant so didn't duck. Fortunately, Mr. Grundstrom required that hard-hats be worn even by outside contractors.

* * * *

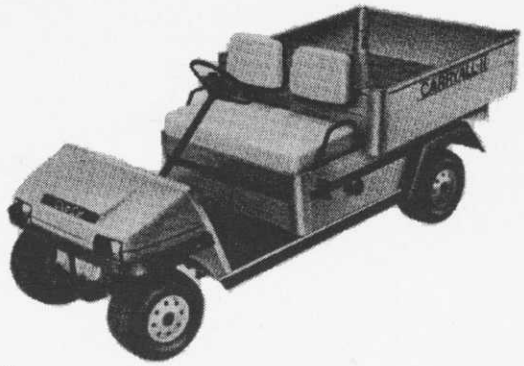
Recently my son and I had an opportunity to fish for trout along the Gunflint Trail just out of Grand Marais. What beautiful country it is! **Norma O'Leary** at Silver Bay C.C. and **Mike Davies** from Superior National at Lutsen must enjoy that part of Minnesota (at least in the summer).

Fly fishing and golf have some similarities. Both are an individual sports where nobody is looking over your shoulder to see if you broke the rules by taking too many fish or too many strokes. Each cast or swing seems to vary in degrees of accuracy and distance. The surroundings are certainly part of the experience. Sometimes your outing is successful and other times you're not so lucky. But in both sports, numbers shouldn't always be a goal for an enjoyable experience.

* * * *

Remember the ***MGCSA Amateur Championship*** held at **Baker National** is for all skill levels. **Keith Greeninger** says to sharpen up your target golf and bring a few extra golf balls than normal for **August 14th.**

Wanted!



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