

(Continued from page 9)

the time of dormant fertilization and again immediately after snowmelt. Several packets were placed in the plots to allow for removal at different times and analysis for the amount of organic N remaining in them. This technique allowed me to verify whether or not mineralization of organic N occurred prior to snowmelt and to track mineralization until such time that clipping N content could serve that function.

To help explain the effects of surface drainage, turfgrass clipping height and color of topdressing material on spring response to dormant applied Milorganite, plot temperatures were measured at a 1/2-inch soil depth. This was accomplished with thermocouples connected to dataloggers that recorded soil minimum, maximum and mean temperature on a daily basis.

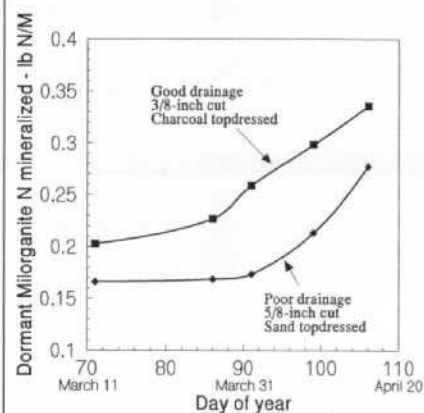
### Mineralization of Dormant Applied Milorganite

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 3/8-inch cutting height than at the 5/8-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 3/8-inch and topdressed with charcoal. Conversely, N mineralization was slowest on the site with poor surface drainage on plots mowed at 5/8-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

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



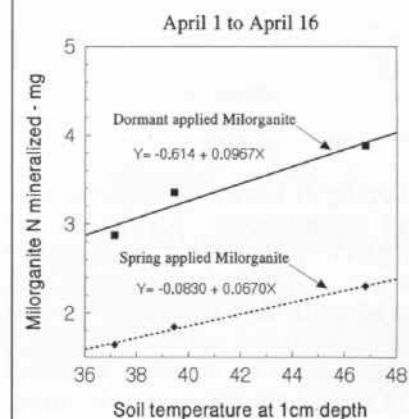
been mineralized (Fig. 1). This is evidence that mineralization did occur between the time of application of the dormant Milorganite on November 23 and the time of snowmelt. The fact that soil freezing occurred 4 days after November 23 suggests that this mineralization took place primarily during the winter under the generous snow cover on the plots. It is of interest to note here that due to this deep and continuous snowcover, soil temperatures at the 1/2-inch depth never dropped below 25 degrees. On a percentage basis, overwinter 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

frame (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 applied 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.**



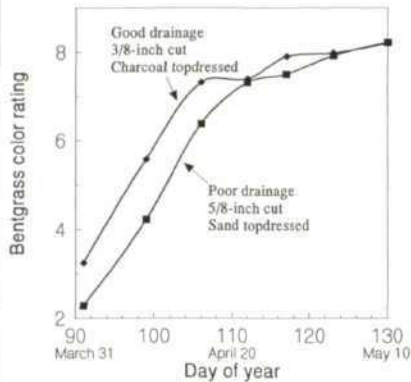
### Bentgrass Greenup

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 3/8-inch, and it had been topdressed with charcoal (Fig. 3). Slowest greenup was where surface drainage was poor, the mowing height was 5/8-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 amounted 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 collected on April 15 (Fig. 4) reflected very nicely treatment influences on dormant N mineralization (Fig. 1) and on bentgrass color (Fig. 3). Differences

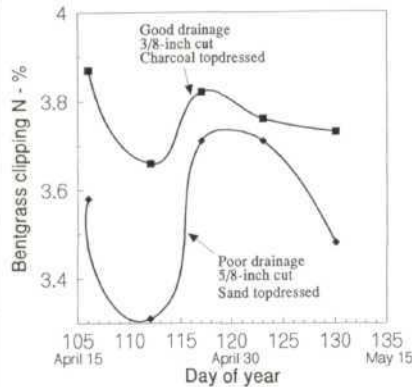
**Fig. 3. Effects of surface drainage, height of cut and topdressing material on bentgrass color in the spring following application of dormant Milorganite.**



in clipping N between the best and worst conditions for dormant 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 collec-

tion 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

**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.**



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 declined 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

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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 influences of these three factors were found to be additive. When good surface drainage was combined with a 3/8-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 5/8-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.

#### Aknowledgement

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

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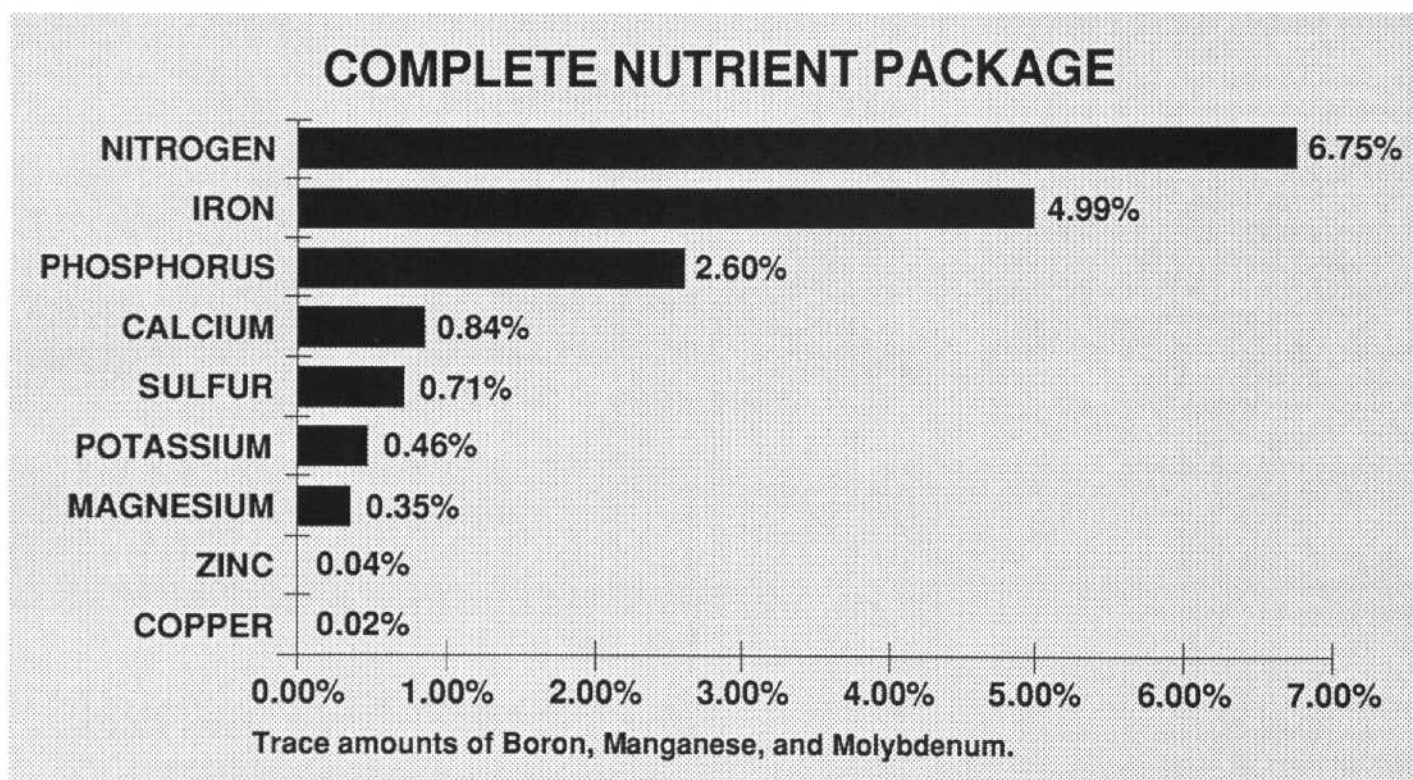
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# Pilgrimages for Golf Course Superintendents: GCSAA HEADQUARTERS

By Monroe S. Miller

I am closing in on a quarter of a century as a member of the Golf Course Superintendents Association of America. It has been an organization I have been proud to have been associated with for all those years.

Not everything GCSAA has done has pleased me or met with my approval. But that's probably true for almost any organization any of us belongs to as a member, whether it's a church or the Boy Scouts or even a college alumni organization.

The GCSAA has been a good professional group to identify with in the world of golf. That identity, for me, goes back to undergraduate years at the University of Wisconsin-Madison when I was a student member of GCSAA and the recipient of a \$300 scholarship. That was a lot of money in the mid-1960s. But of greater value was the attending honor; that scholarship badge is one I still wear with pride.

The scholarship was the reason why, on a trip to the Chicago area for different reasons, I took time to look up the GCSAA headquarters that year nearly 30 years past. It was located in Des Plaines. I recall even some nervous-

ness as I slowly but surely figured out about where the office was and got closer to it. At that time it was my professional "mecca" and logical that enormous anticipation would be the emotion of the day.

What a letdown—headquarters was, at that time, underwhelming. I am being charitable with that. I remember going in, talking to a person or two, and leaving. The employees couldn't quite figure out what I wanted (nothing) or what I was doing there (exercising a pilgrimage). Disappointed, I saddled up and tended to the business I had really intended.

In the intervening years, GCSAA moved from Des Plaines to Lawrence, Kansas. I vaguely recall some spats about moving "to the middle of nowhere" in the early 1970s, but I paid little attention. I was busy with a young family and working furiously getting established at my golf course. My involvement didn't go beyond paying my dues on time and attending the national conference.

Involvement in one's state chapter, I've observed many times, often opens the door to involvement in national

*(Continued on page 17)*



The sight of GCSAA headquarters at your arrival is impressive and the landscaping is up to par, which wasn't the case at the St. Andrew's Drive building.



The original wing of the building is on the left; the empty addition is on the right.



A look from the back of the building—the original wing is on the right; the new addition is on the left.



A close-up view of the fountain at the main entrance.

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(Continued from page 15)

affairs. That happened to me in the early and mid-1980s and on a couple of different occasions I made the trip to Lawrence to attend committee meetings. Both of those trips were pilgrimages, no doubt.

Obviously, the first time out there was the one that filled me with the greatest sense of anticipation. It is an easy trip, contrary to those 1970s fears of "middle of nowhere". Lawrence is a half hour trip or so from the Kansas City airport and the Interstate system takes you there quickly.

Any member making the trip to GCSAA headquarters is treated to an efficient travel office that gets flights, cars, hotel arrangements and colleagues-to-meet all set. They make it as hassle free as possible, recognizing that we are actually there on business and do not have the time for delays. I give staff a lot of credit for that.

I was quite surprised when I saw the first building, located on St. Andrews Drive (the name was obviously not a coincidence). At first I thought it looked more like a home than anything. Granted, it would have been a BIG home, but it didn't look like I thought an office building of ours would look. Wood construction, gray stained cedar siding and a golf course location gave it a very comfortable look. A few of us commented on how lucky employees there were to have such pleasant working circumstances.

A couple of years after that first trip I went again. It was pretty hard to miss the growth of the Association. The headquarters office was bulging at the seams! Honestly, I think they actually had desks in closets they were so short of work space. A few of us were on the deck that faced the golf course—Alvamar C.C.—and concluded there would either have to be an addition soon or an entirely new building. It wasn't prophetic on our part, just a very obvious conclusion by some common sense guys.

Interestingly, each of those meetings was chaired by a man who was to become GCSAA president—Bill Roberts the first time and Joe Baidy the second.

Staff work hard to make these trips by committee members and decision makers memorable. Clay Loyd took the communication committee members to Topeka, short drive west of Lawrence. Topeka is the state capital of Kansas and we toured the capitol building. Of course since I've visited many of the capitols around the country I was more excited than many others. That thrill was amplified when we walked in and saw a capitol building decorated with huge murals that looked very familiar. I'd have bet the farm that John Stewart Curry had painted those walls.

I was right; he had. Curry was the first artist-in-residence at the University of Wisconsin—Madison. The residence is between the Stock Pavilion and Babcock Hall. A print of



**A small room just off the lobby area was a perfect spot for our subcommittee to convene.**



**Amenities in the building include an A/V lecture hall.**

Curry's, *A Wisconsin Landscape*, hangs in my office. It is a small world.

Topeka was (still is, I imagine) where Clay lived, so we received a grand tour. That included the plant where *Golf Course Management* was printed. We had dinner at the Topeka C.C. with the course superintendent, a fitting ending to an interesting trip.

The second time I visited headquarters the experience was highlighted by a stay at a historic old downtown hotel, the Eldridge as I recall. That, too, was a treat.

It may well be that I've appreciated these pilgrimages to Lawrence because of the similarity between that town and the one I have lived and worked in since 1964. Lawrence is the home of Kansas University. They are both college towns through and through. In Madison, there are times when I think half the people here originally came to attend the UW—Madison, fell in love with the UW and the city, and never left. Cheryl and I are in the 50%!

So it is in Lawrence. Every other person you talk to, or so it seems, is a KU graduate. The line is the same: "I came here to go to college and decided to stay."

Lawrence is much smaller than Madison and there are no lakes. But neither is it flat and treeless like I sort of expected. It is rolling country with lots of trees; it is really in an attractive landscape. The vision I had of a plains area actually begins west of Topeka.

KU isn't as big as the UW, but it has a place that reminded me of Bascom Hill—there is a slope that leads from central campus to the stadium. It's really neat. For some reason the school's atmosphere reminds me more of a private college than a public one.

My most recent pilgrimage to GCSAA HQ was literally only a few weeks ago, in mid-September. It may, in retro-



**The view of the east (approximately) is a look at KU and most of Lawrence.**



**The view to the west (approximately) from the lobby is anything but flat barren prairie.**



spect some time from now, be the best one of the three trips I have made there. I was invited to serve on a technical information services (TIS) committee. GCSAA has done some big thinking on the issue of information in our world of golf turf; they had reached the point in planning where input from member all across the country was needed.

It was the best pilgrimage for several reasons. Because of my own interest in information, the reason for the trip intrigued and excited me. Secondly, I was very nosy about the headquarters building we'd built along with the addition which was sitting empty (according to the rumor mill). Finally, I needed some kind of sense that the new leadership and new staff were headed in what I thought was about the right direction.

The trip out was all the usual—arrive late Friday, work somewhat furiously Saturday and Sunday, and return home late Sunday to be back at work on Monday.

It was usual in another way. The colleagues I got to know will likely remain acquaintances for a long time. They were great guys, very professional and thoughtful about the issues before them.

Unusual were two things: new staff, especially Joe O'Brien, were better and more competent than I had expected. You can read that report elsewhere in this issue. David Bishop impressed me, too. He's a former turfgrass extension staff member from the University of Nebraska. And then there was the new building.

It is huge! If architecture is your bag, you'd like this structure. It is very pleasing to the eye, has an interesting interior,



GCSAA Director Dave Fearis is from Kansas City; he drove a truck to the meeting! Bruce Williams chaired the meeting; Joe O'Brien made our time productive.

and appears to be a great working environment.

The reason it is huge is the addition. The rumors are true—two floors were completely empty and the third floor is at best underutilized. So any beef members have expressed about paying for an addition that wasn't needed are legitimate. But I guess you can say "there's always the future."

By the way, the old headquarters building still wasn't sold at the time I was there.

This 1994 trip to Lawrence had its fun, too. We attended the KU/Michigan State football game. For a guy like me who has (for decades) had season tickets to UW football games and Packer games, it was the ultimate venue for free time. Bruce Williams ran a good committee meeting, but his alma mater embarrassed him and the rest of the Big Ten—KU won the game!

So what is the conclusion from these "jottings"? For me, the pilgrimage out there has always been inspiring. This year it served that and a reaffirmation that calm seas are ahead after the troubled waters of the recent past. The pride is back, overall satisfaction has returned (although I can always find areas to encourage improvement in), and members should feel their interests are being sincerely served to the best of everyone's ability.

I am already hoping I will get to Lawrence again. Real soon. ♣

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# ANNOYE AND CROTHERS ARE WINNERS IN JOHN DEERE TOURNAMENT

By Tom Schwab

Jo Annoye, superintendent at Idlewild Golf Club, took first place honors in the 1994 edition of the John Deere Team Championship. The teams consist of the superintendent, professional, manager, and president. These four-person teams compete in a modified scramble format. The Door County team, led by Annoye, carded a negative 21 score of 50 to walk away from the field. This qualified them to represent Wisconsin at the National tournament in Palm

Springs, California.

The other winner for the day was Jim Crothers. His twenty-three peers, who brought teams to the event, thought he was a winner for hosting his second John Deere Tournament. Once again he had his Grand Geneva course in excellent condition. He and his crew's effort were appreciated by all.

John Buck and John Maguire of J.W. Turf also deserve a lot of thanks. They were the organizers and sponsors of the event.

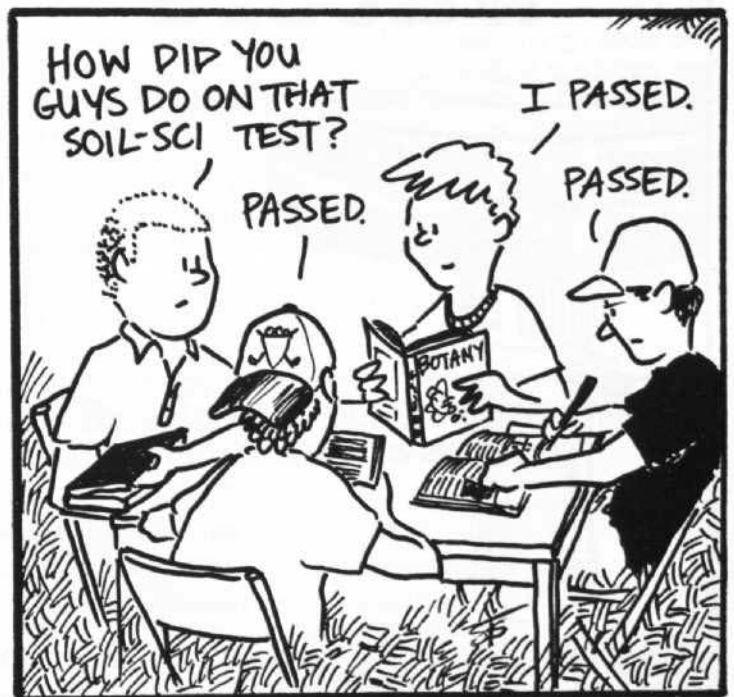
There were ties for second and third place teams. Taking second place money were team Blackwolf Run led by Ed Kirchenwitz and team Tuckaway led by Jim Poitz. Tied for third place were Jack Soderberg's team Western Lakes and Jim Knulty's team Big Foot. The winners in the low pro tournament went to Dave Hicks of Idlewild with a 68 and Rick Rasmussen of Western Lakes with a 71.

We all wish the best to Idlewild in the national competition. ♣

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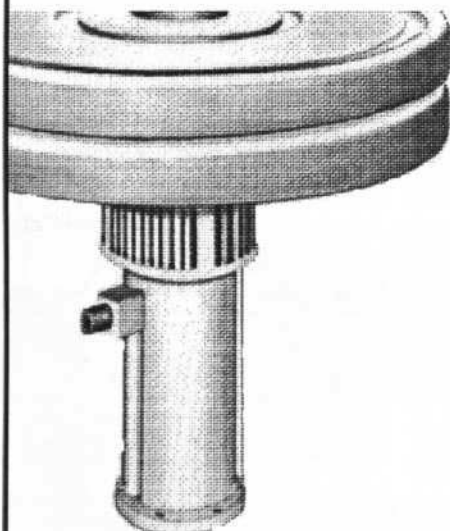
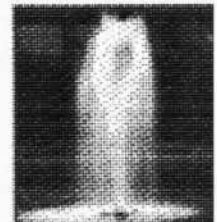
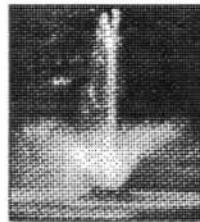
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