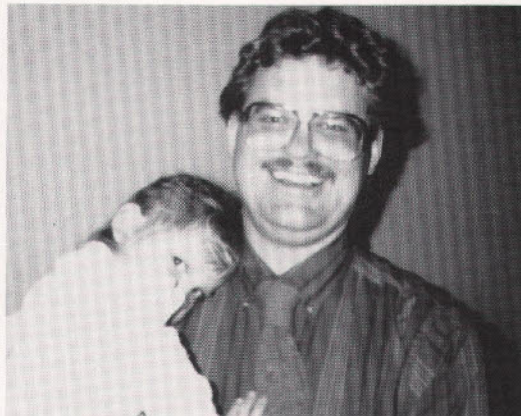


GCSAA PUTS ON ANOTHER GREAT SHOW!

By Monroe S. Miller



Scholarship winner Jeff Bahr and proud parents Betty and Joe.



Holly Handrich (and her dad, Mike).



Our friends from Columbia were flying high!

GCSAA Conferences and Shows remind me of the old saying about sex, the one that goes "there isn't such a thing as bad sex; some times are just better than others." All of the GCSAA shows are great learning opportunities; the 1989 version was exceptional.

The opening session again this year had a distinctive Wisconsin flavor. Jeff Bahr was on the dais as a GCSAA scholarship winner. WGCSA past president Bill Roberts was there with other directors and officers. The *GRASS ROOTS* was recognized as a chapter newsletter award winner.

The educational sessions have been tightened up. The subject matter this year seemed to be more focused. The Friday morning and afternoon lectures on governmental relations, environment issues, and legal considerations were extremely valuable given circumstances in our society today. In a way, it seems a shame to be dealing with topics like those instead of agronomic subjects.

For many of us in the north central region of the U.S., where *Poa annua* is so prevalent, the lectures on that plant that covered an entire day were extremely valuable.

As usual, some of the finest educators and investigators in our business were there. Jim Beard received the USGA Green Section Award this year in recognition of his achievements.

There was a lot of complaining about the weather, however. The participants in the golf tournament suffered a sand storm, rain, wind, snow and ice. Many missed the first day of two-day seminars because travel between Palm Springs and Anaheim was impossible due to the bad weather. One day set a record for the date — L.A. had its lowest high temperature for the day in history. There was snow in the air at Malibu, the Ventura freeway looked like an interstate in Wisconsin and nearly half the days had rain (which they needed desperately).

The show matched its billing as "biggest" yet as four

halls were filled with the latest in equipment, fertilizers, pesticides and the host of other products used to keep America's golf courses in good playing condition. Hot items this year included the new five gang lightweight mowers. A new triplex riding greensmower was introduced. Plant growth regulators are drawing increasingly serious attention from golf course superintendents. High tech and biotech products were everywhere.

The WGCSA co-hosted a hospitality room with MMSD, and many of the Wisconsin superintendents in Anaheim were there on Saturday night. Jacobsen Division of Textron had a great idea on Saturday night — they held a reunion for all past students from the annual College Student Seminar. This editor especially enjoyed it after learning I am an alumnus of the first class, the Class of 1968. A lot of Wisconsin superintendents were there as alumni, too.

Other educational offerings of the 1989 conference were outstanding — major speaker sessions, one and two-day seminars. The USGA Green Section Conference, planned largely by our own Jim Latham, was terrific. The program presented by the American Society of Golf Course Architects gave superintendents a chance to listen to and question the finest of today's golf course designers.

Tradition has it the conference ends with the annual banquet. Chi Chi Rodriguez was presented the Old Tom Morris Award, and was yet another deserving recipient. Frank Hannigan was given special recognition by the GCSAA as he leaves the USGA for other opportunities in golf. And Bobby Vinton, heartthrob of the 1960s, gave an entertaining show.

Despite the unadvertised weather, smog, traffic and raft of social problems unfamiliar to most Wisconsin people in Anaheim, it was a great conference and show. I think I could say everyone would go back again.

Continued on page 22



John Deere introduced a new triplex greens mower in Anaheim.



A new five-plex was introduced at the show, along with . . .



. . . a new seven-plex! Both are on light-weight tractors.



Many WGCSA members stayed at the Marriott. The palm trees are misleading—the weather was NOT tropical!

Which Show WAS The Best?

This question was put to as many of the conference attendees as this pollster could remember to ask. The results are “unofficial” (whatever that means). There were no specific criteria to be applied to the question. Nearly everyone answered quickly, making it clear that most did have a favorite.

A favorite choice was usually due to the city hosting the conference. Many chose their first one because it is such an overwhelming experience.

It is also interesting and important to note that no one disliked any of the GCSAA events. Some were just better than others. The headquarters staff has always done a superb job of making arrangements for these conventions, regardless of the site. So the preferences do come down to the personality of the cities.

Although I’m not a betting man, my guess is that next year’s meeting in Orlando will be extremely popular and heavily attended by GCSAA members and their families.

The following list does not include all Wisconsin people in Anaheim for the 1989 conference. Inclusion was by accident and omissions were innocent.

Bob Erdahl — 5 total; San Francisco was an easy first.

Jerry Kershasky — 15th consecutive; Las Vegas was 1st because free parking and no hassles with car; easy to get around.

Tom Schwab — 8th conference; Washington D.C. favorite; San Francisco close 2nd; wouldn’t go to Houston again.

Pat Norton — 1989 his 8th conference; he missed only one since 1981. Liked San Francisco best because of the city.

Tom Parent — 5th GCSAA conference. Washington, D.C. easily his favorite although he loved San Francisco.

Mike Semler — Anaheim was his 6th in a row; his favorite was Phoenix, primarily due to the great weather and Dr. Love’s GCSAA DSA presentation.

Mike Handrich — 5th in a row; Phoenix an easy winner because of weather! Also liked Anaheim in 1989.



Many WGCSA members flew in and out of Orange County’s John Wayne airport. They thought they were in some far outpost—the facilities were very limited.

Don Ferger — 4th national convention and San Francisco was a first place winner. He says it's a "neat" city. He also loved Phoenix's warm weather.

Randy Witt — 14th trip in 1989. He also places San Francisco 1st and gives 2nd to Las Vegas (a great place to get around in).

Joe Bahr — Joe's been to 5 nationals and liked Atlanta best.

Curt Larson — A veteran at this business, Curt has attended 17 straight conferences. His favorite was Las Vegas because it was a good city for working such a show.

Mark Kienert — He's gone to 10 shows although not consecutively. Liked Anaheim (1981) best, Washington, D.C. comes next.

Rod Johnson — 10th consecutive conference. He gives Phoenix a first place (great weather) and Las Vegas second.

Bob Reinders — Sit down when you read this: Bob's been attending GCSAA conferences since 1958! He says Las Vegas is best, followed by Anaheim.

Ray Knapp — Ray's another veteran. His first was in Miami (a last place finish). His favorite was New Orleans, due to great food. Ray's wife Carol gave Portland its only first place vote.

Bob Belfield — 1st choice was easy — 1989 Anaheim because it's his first one!

Bill Roberts — the former WGCSA president (and future GCSAA president) has made 12 of the last 13 conferences. His favorite? San Francisco. Why? The election!

Scott Schaller — 2nd consecutive trip. Anaheim is an easy win over Houston.

Dan Quast — This veteran of 25 shows gives his vote for first place to Las Vegas. His first conference was in Philadelphia in 1964.

Jim Belfield — 16th consecutive show for JB. San Francisco was the best for him.

Chad Ball — No hesitation here — San Francisco. "Great city." He was equally quick to put Atlanta last.

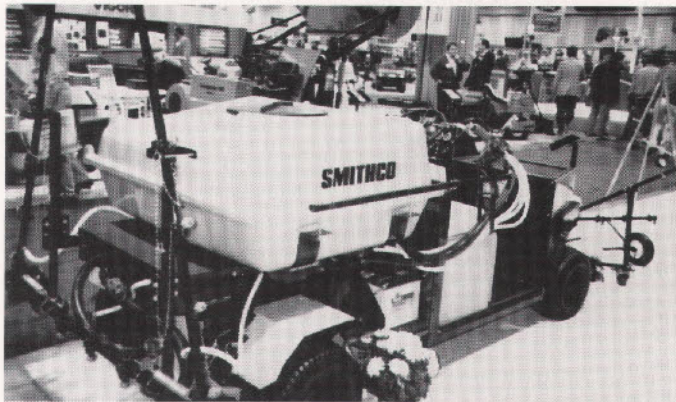
Roger Bell — His 1st one was the best of the 15 he's attended — New Orleans. Houston and San Antonio tied for last, by the way.

Pat Shaw — 2nd trip to the national makes guessing his favorite easy. You are right — Anaheim won over Houston.

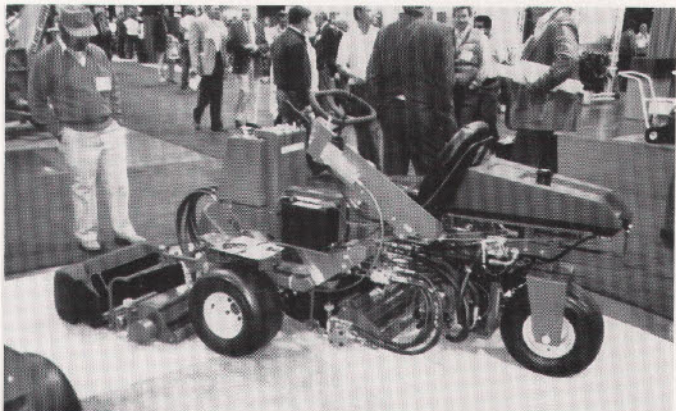
Continued on page 25



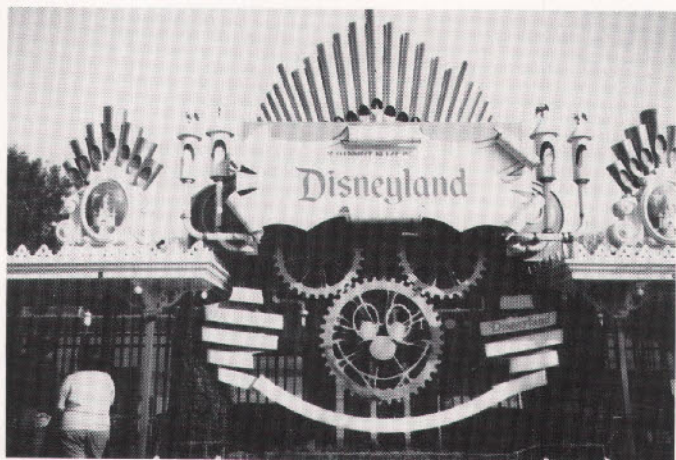
A couple of former Racine residents. Do you remember their names?! They were attending the Jacobsen College Student Seminar Alumni Meeting.



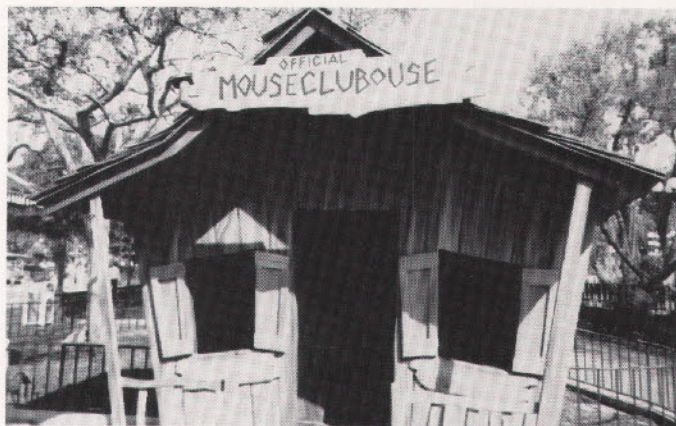
A new low profile sprayer for sale in 1989.



One of the six riding greensmower brands available at the show.



The "happiest place on earth" was a short walk across the street for most.



If this is their clubhouse, what must the golf course look like?

NATURAL ORGANIC

Milorganite[®]

FERTILIZER

***America's
Number One
Natural
Organic
Fertilizer***

- *Many of the finest golf courses in America are fertilized with Milorganite.*
- *Non-burning, cost-effective, turf fertilizer.*
- *90% Water Insoluble Nitrogen (W.I.N.), slow release nitrogen promotes vigorous growth.*
- *Rich in organic iron — 4% minimum guaranteed.*
- *Supplies humus and improves water holding capacity of soils.*

FREE LITERATURE

*Mail in the coupon below for further information
or call 414-225-2222.*

Please send me further information

- Milorganite's Specialty Fertilizer Program*
- Milorganite's Iron — Technical Bulletin*

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

(_____)

PHONE # _____

Mail to: Milorganite • 735 N. Water St. • Milwaukee, WI 53202

Continued from page 23

Wayne Otto — Another veteran here; Wayne has only missed 3 GCSAA conferences since his first one in 1964. He liked San Antonio the best (Mexican food).

Carl Grassl — Another man who says, "The first one was the best." That was at the Fontainebleau Hotel in 1969 in Miami Beach, Florida.

Bruce Worzella — Started going in 1979, has only missed one. Loved the 1984 Las Vegas convention.

Red Roskopf — After 7 conferences, his favorite is Anaheim.

Steve Blendell — 5th show for Steve. Washington, D.C. is his favorite. Steve would like to see a northern site more often. Amen.

Jim Shaw — After four GCSAA trips, Las Vegas was his favorite.

Bob Welch — This veteran goes back to the 1962 Miami Beach meeting. He liked New Orleans best but Portland's a close 2nd. He only missed Kansas City in 1966 — great record.

Randy Smith — 15th meeting. Liked the Atlanta site best because he took his kids with him and went on to Florida.

John Krutilla — 17th conference. His favorite was the 1981 Anaheim meeting; he was able to bring his wife and kids along on that trip.

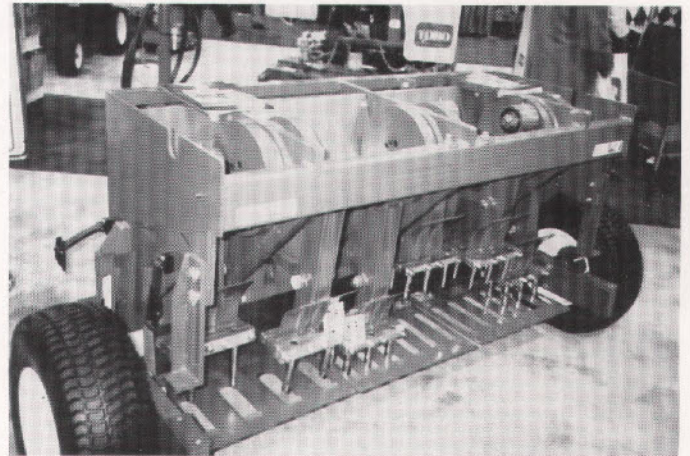
Jim Latham — Another man who liked his first GCSAA conference in Louisville, in . . . 1957! Since then Jim has only missed Houston in 1960 and Toronto in 1961. Great job, powerful dedication. Jim has the record of the Wisconsin crowd for GCSAA conference longevity.

Dave Beno — 7th consecutive for Dave; he liked Atlanta best.

Monroe S. Miller — 17th consecutive. Subscribes to "1st is best." Boston in 1973. Another reason—Boston is America's greatest historical city.

OFFICIAL RESULTS OF UNOFFICIAL WISCONSIN POLL OF FAVORITE GCSAA CONFERENCE CITIES

1. San Francisco
- Anaheim
3. Las Vegas
4. Washington, D.C.
- Atlanta
- New Orleans
7. Phoenix
8. Boston
- Louisville
- Miami Beach
- Portland
- San Antonio



Toro's new PTO driven fairway aerifier.



Trees For Today

MOVING • SELLING • BUYING TREES

- Moving trees up to 7"
- Fertilizing with liquid injection
- Buying and selling trees
- Travel anywhere in state
- Member of W.G.C.S.A. and Wis. Arborist Assoc.



Pete Van De Hey
(414) 532-6652

Rt. 3, Hwy. 41
De Pere, WI 54115

We dug into the tall fescue control problem.
So now you don't have to.

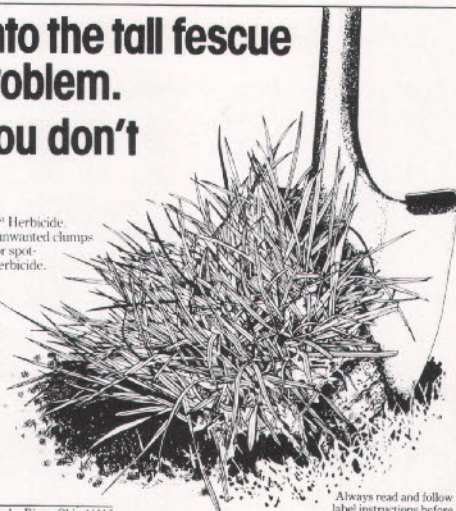
Introducing LESCO TFC® Herbicide.
The new, easy way to remove unwanted clumps of tall fescue without digging or spot-treating with a non-selective herbicide.

LESCO TFC is the first product to provide selective spot control of tall fescue in Kentucky bluegrass, bentgrass, fine fescue, bahia-grass and bermudagrass, while allowing desirable grass to fill in. This water dispersible granule offers convenience and accuracy.

Order today!
Nationwide • (800) 321-5325
In Ohio • (800) 686-7413

LESCO

LESCO, Inc. 20066 Lake Road, Rocky River, Ohio 44116
(216) 333-9250



Always read and follow label instructions before using any chemical product.

LEIBOLD IRRIGATION COMPANY

Professional
Installation of
Complete Golf
Course Irrigation
Systems.



Excellence in Irrigation®

John Leibold
(815) 747-6817 Bus.
(319) 582-9351 Home
620 Sinsinawa
East Dubuque, IL 61025

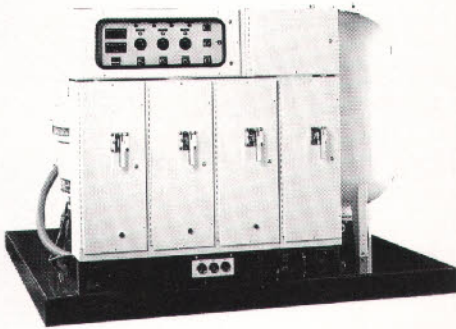
"Satisfaction Guaranteed"

The Choice Is Yours

There are over a dozen different pump station manufacturers on the market today, each with their own specific design and control methods. Choosing the right pumping system can be a frustrating experience.

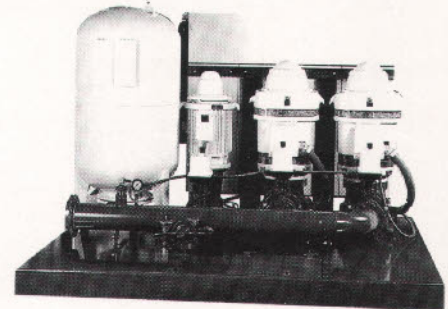
Now you can make the right choice. Match your irrigation requirements to one of Watertronics' quality engineered pumping systems, all built for years of dependability at affordable prices.

A



PREFABRICATED PUMPING STATIONS

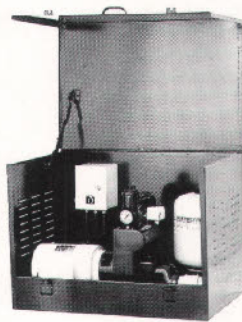
Vertical Turbine pumping systems with fixed or variable speed motor controls. Centrifugal pump stations for wet-sump, flooded suction or booster applications. All are equipped with Watertronics state-of-the-art control panels plus your choice of electronic or conventional hydraulic regulating valves.



B

LANDSCAPE/SPORTS TURF PUMP STATIONS

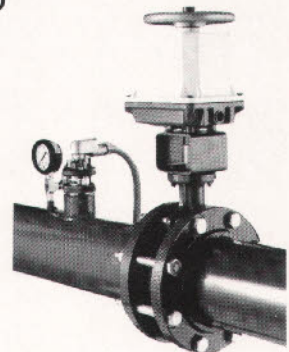
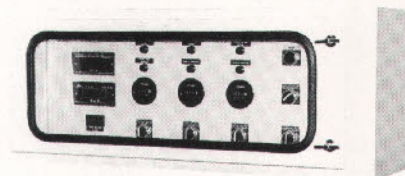
Compact, efficient, and affordable are these self-contained single pump systems. Suction Lift/Wet Sump models feature capacities of 50-600 GPM, with Booster model capacities up to 1000 GPM.



C

ADD 1980'S TECHNOLOGY TO YOUR PRESENT SYSTEM

Watertronics retrofit control panels and electronic regulating valves can add new life to your existing pumps. Eliminate pipe shattering surges. Upgrade your control system to provide accurate pump sequencing, consistent pressures and economical irrigation at affordable prices.



D

HYDRAULIC SPRINKLER CONTROL BOOSTER STATIONS

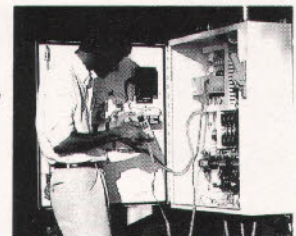
Provides precise filtered supply line pressure for your hydraulically controlled sprinklers. They feature multi-stage booster pump, replaceable bladder tank, and pressure regulating controls.



E

PROFESSIONALLY TRAINED SERVICE REPRESENTATIVES

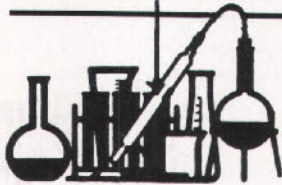
Watertronics utilizes factory trained service representatives, and knowledgeable sales professionals to meet all your sales and service needs.



So, if your system's not currently pumping up to par, contact a Watertronics representative, call toll free, 1-800-356-6686. In Wisconsin 414-782-6688.

 **WATERTRONICS**
ELECTRONICALLY CONTROLLED PUMPING SYSTEMS

13400 A Watertown Plk. Rd., Elm Grove, Wisconsin 53122



QUESTIONS FROM THE FLOOR

By Dr. Wayne R. Kussow

1. I've just received results from the State Soils Testing Lab of samples sent in last fall. I tested all my fairways. In every case, the phosphorus test read 400 lbs/A and the reading was nearly off the scale in the "excessive" range. Should I be worried? What can I do?

DANE COUNTY

ANSWER: Worry is too strong a term. Vigilant and concerned are more appropriate. Be vigilant because there is the possibility of high phosphate levels triggering one or more micronutrient deficiencies. This possibility is, however, quite remote. I'm not aware of any confirmed micronutrient deficiencies on turfgrass in Wisconsin and certainly none induced by overfertilization with phosphate.

Concern should arise over how soil phosphate became "excessive". This cannot happen overnight. Rather, soil phosphate levels such as these represent years of phosphate applications that were not needed.

What to do? Examine your fertilization program. Applying more than 0.25 to 0.50 lb/(1000ft²(M)) of phosphate annually is more than what is removed in clippings and will slowly buildup soil phosphate levels. In your case, where soil test phosphate is excessive, the recommendation is to not apply any phosphate until soil test levels drop to something in the range of 75 to 100 lb/A. Then institute a maintenance program of 0.25 lb/M (10 lb/A) phosphate annually. If soil tests continue to decline, increase the rate to 0.5 lb/M/season.

2. I've been receiving some literature on a product called N-Sure. Using a new fertilizer formula known as triazine, it sounds like it is too good to be true (controlled release, low burn, high stability). Does this product have a place in the management of good golf turf?

MARATHON COUNTY

ANSWER: N-Sure granules consist of powdered triazine (also known as nitrazine and melamine) embedded in urea. Pure triazine has a guar-

anteed minimum N content of 66%. Its water solubility at room temperature is 0.5%, which is five times that of IBDU but still far too low to cause salt injury. Release of N to turfgrass from triazine is by way of microbially mediated hydrolysis. Initially, the rate of hydrolysis is very slow. In fact, it is so slow that for all practical purposes there is no N release to turfgrass during the first four to six weeks after application. This is why triazine is blended with urea. Once hydrolysis begins to release significant amounts of plant available N, triazine appears capable of satisfying turfgrass N needs for a period of 12 to 14 weeks providing a high enough rate is applied. By relying on urea to meet turfgrass N requirements during the first several weeks after application, N-Sure begins to look like a fertilizer that needs to be applied only once each season.

Field testing of N-Sure has not been extensive, but the product has been shown to be capable of maintaining satisfactory color in Kentucky bluegrass until fall when applied at the rate of 100 lb. N/A in early spring. Turfgrass color tends to drop off rapidly in mid-to-late fall, just as it does with any slow release N source that depends on microbial action for N release.

As with any new product, I would not advise anyone to get too excited about N-Sure until you've experimented with it on a limited basis. If you do decide to try the product, do so in such a way that you have side-by-side strips of turf treated with N-Sure and your normal N applications. If you're naturally skeptical of new products, come to the WTA Field Day next August. Triazine is one of the entries in a fertilizer demonstration installed last fall on a golf tee at the Yahara Hills Golf Course.

3. I've been on a sand topdressing program for over a decade now and for a lot of different reasons I'd like to switch back to using an amended sand material. From what I've read and all I've heard, it seems I

shouldn't even consider this. What do you think?

OUTAGAMIE COUNTY

*ANSWER: I think the blanket statement that "once on a sand topdressing program, always on a sand topdressing program" is long overdue for some qualifications. The basic qualifier is that one must never create abrupt soil layers that differ substantially in their moisture characteristics. If you are thinking of switching from pure sand to something like an 80/20 sand-peat mix using basically the same sand as before and if you continue to core aerify on a regular basis, then you will not create the type of layering such as that often associated with black layer formation. This, of course, assumes that your present sand layer and the original soil beneath do not already present sharp contrasts in water infiltration rates. Assuming here that they do not, then I see no reason why you should not change to an amended sand material **providing the two "ifs" noted above are satisfied.***

4. I'm wondering if I should climb on the "high K bandwagon" so many of my colleagues are riding these days. Many are using 1:2 and 1:3 N/K ratios. What do you recommend for N/K ratios for Wisconsin golf green turf? Do you have a recommended SSTL level for K in golf green rootzones based on this increased interest in potassium?

BROWN COUNTY

ANSWER: The high K bandwagon exists for two reasons: (1) experimental evidence that high levels of K in turfgrass are associated with greater stress tolerance; and (2) recognition that USGA greens mixes have low K storage capacity and, for this reason, are notable for high K leaching rates. What constitutes an appropriate N:K ratio, therefore, depends on whether we're talking about USGA greens mixes or natural soil and/or older mixes that contain substantial amounts of soil. Silt loam

Continued on page 28

Continued from page 27

soil easily stores 500 or more lbs/A of plant available potassium and allows for little or no leaching loss. Under this circumstance, once soil test K is built to 300+ lbs/A, annual application of 0.8 lbs K_2O/M for every pound of N applied will put your turfgrass on a high K diet. Assuming the K goes on only once a year (preferably in early fall), the annual N rate is 3 lbs and the K is going on with 0.5 lbN, then we are, in fact, talking about a fertilizer whose N: K_2O ratio is nearly 1:5 in order to have 0.8 lb K_2O per pound of annual N.

Because of K leaching loss from USGA greens mixes and a K storage capacity of only about 250 lbs/A, the fertilizer N: K_2O ratio required is generally in the range of 1:1.0 to 1.2. In this case, it is impractical to even think of getting by with only one or two K applications per season. If all the N is going on as a dry material, the appropriate N: K_2O fertilizer ratio is 1:1 to 1:1.2. However, the most common situation is one in which N is being applied at frequent low rates for much of the season, often as a urea solution. Then there is no alter-

native but to apply K alone (preferably as K_2SO_4) three or four times each year. The appropriate rate for each application is the annual N rate multiplied by 1 to 1.2 and divided by the number of applications.

Owing to the fact that we can't expect to build K levels much above 250 lb/A in USGA greens without getting excessive leaching, this is a reasonable soil test to shoot for. However, we need to realize that this is not enough K to keep turfgrass on a high K diet for an entire season.

5. My soil test results are starting to scare me. Soil pH values have slowly been rising in green, tees and fairway results. Many are now in the 7.6-7.8 range. Am I risking real problems of nutrient availability yet? Should I be on an elemental sulfur program? How many lbs/A can I safely use? When's the best time to apply?

ROCK COUNTY

ANSWER: Your pH values have risen to 7.6 to 7.8 because you, like many others in the state, are irrigating with hard water. Every time you irrigate you're applying calcium

and magnesium that act as liming material. Your pH values should not increase much above where they are at the present time.

We normally think of high soil pH as a common cause of micronutrient deficiencies in Wisconsin turf. The most likely candidate is iron, but we haven't seen any Fe deficiency.

The pH rise you've experienced is common, cannot be avoided and, at least so far, has not seemed to create nutrient deficiencies. For this reason alone, I'm not a proponent of elemental sulfur programs. Even if widespread micronutrient deficiencies did begin to show up in turfgrass growing on high pH soils, elemental sulfur would not be the total answer to the problem. There are several reasons for this. Sulfur neutralizes soil alkalinity only as a result of microbial oxidation to sulfuric acid. Theoretically, (i.e., when 100 percent of the sulfur is oxidized), slightly more than the equivalent of three pounds of calcium carbonate is neutralized per pound of sulfur applied. Even then, the amount of sulfur required is impressive. For example, decreasing the pH of a sandy soil

**Scotts most
successful product is
not available for sale...**

**only for advice and
support... your ProTurf Tech Rep.**



Dick Evenson
Senior Technical Representative
ProTurf Division
O.M. Scott & Sons

443 Woodview Drive • Sun Prairie, Wisconsin 53590
Telephone: (608) 837-6563

from 7.5 to 6.5 requires approximately 500 lb/A or 12 lbs/M of sulfur. Contrast this with the fact that turfgrass injury is likely if more than 2 lbs/M of sulfur are applied at any one time and if more than four lbs. are applied in a single season. Clearly, soil pH control with sulfur has to be approached as an annual affair extending over several seasons.

Another problem with pH control through sulfur application is incomplete sulfur oxidation and, therefore, less than 100% effectiveness. How much sulfur will be oxidized varies greatly from one soil to another and is unpredictable. In the years to come we're going to hear a lot of heated discussion about the effectiveness of sulfur applications, simply because oxidation rates vary widely from one location to another.

Finally, in turf, sulfur must be surface applied. Soil pH at the surface will eventually drop very low, perhaps as low as 3.0. It is only over time that the acidifying action of the sulfur will work its way downward in soil. I am not aware of any studies that show how surface applications of sulfur affect soil pH in both the short and long run.

6. We're rebuilding some putting greens on our golf course next summer. The question I'm confronted with is one that has received a lot of discussion lately. Opinions seem to vary. Do you recommend the very coarse sand layer in the USGA specifications?

MANITOWOC COUNTY

ANSWER: The very coarse sand layer was originally incorporated into USGA greens solely to provide a barrier to prevent fine soil particles

from migrating into the pea gravel bed, clogging pores and impeding drainage. The idea that the very coarse sand layer may not be necessary arose from studies conducted by researchers at Texas A&M University and reported in the November/December 1980 issue of the USGA Green Section Record. They concluded from studies with eight-year-old greens and simulated greens subjected to prolonged saturated water flow in the laboratory that "no significant effect of the two-inch sand layer was evident when proper size gravel was used." In other words, they found no evidence for downward migration of fine soil particles into the pea gravel when the very coarse sand layer was left out.

The USGA Green Section does not refute this conclusion, but emphatically points out that the Texas A&M observations apply only when the 12-inch sand-peat mix adheres rigorously to USGA specifications and the pea gravel falls almost exclusively in the 1/4 to 3/8 inch size range. It is out of concern that these specifications are often not strictly adhered to that the Green Section staff continues to recommend installation of the 1 1/2 inch coarse sand layer over the pea gravel bed.

My recommendation is to continue to install the very coarse sand layer unless your construction materials have been subjected to rigorous laboratory testing, have been shown to meet USGA specs, and mixing of the sand and peat will be as prescribed by the USGA. Most people that I've talked to point out that the cost of installing the very coarse sand layer is not a major component of total green

construction cost and is worth the insurance it provides against drainage system failure.

7. We did some remodeling last year and built a new green. I was under a lot of pressure from the course architect to use straight sand in the rootzone mix. I resisted but still wonder if it would have been okay to use sand alone. He lobbied heavily with my committee and I would like some assurance it was worth the battle. What do you think?

PORTAGE COUNTY


ANSWER: Consider yourself lucky that you won the battle. Unfortunately, your club membership will probably never fully appreciate what you've done for them. Peat is mixed with sand to provide a lower soil bulk density that facilitates root penetration, to increase pore space by 30 to 40 percent so as to ensure adequate aeration and to increase water holding capacity by 60 percent or more. Without this added water holding capacity, it is very difficult to get completely through a single sunny, summer day without turfgrass wilting. Peat also contributes a substantial amount of cation exchange and pH buffering capacity. These mean better nutrient retention against leaching and a more stable soil pH. I know of a pure sand green in Wisconsin that requires 20 lbs N/M/season just to maintain satisfactory bentgrass color!

In summary, mixing peat with sand provides a more favorable physical environment for turfgrass and a chemical environment that makes soil fertility easier to control.

The net results in the long run are
Continued on page 31

Gelhar Sand
Serving Golf Courses Since 1919

Silica Sand - Washed, Screened and Blended
Top dressing and Bunker Sand.

<p>Chemical analysis of Washed Silica</p> <table border="0"> <tr><td>Silica</td><td>99.941%</td></tr> <tr><td>Iron Oxide</td><td>.018%</td></tr> <tr><td>Aluminum Oxide</td><td>.012%</td></tr> <tr><td>Calcium</td><td>.004%</td></tr> <tr><td>Magnesium</td><td>.003%</td></tr> <tr><td>Sodium</td><td>.001%</td></tr> <tr><td>Potassium</td><td>.001%</td></tr> <tr><td>Titanium</td><td>.001%</td></tr> </table>	Silica	99.941%	Iron Oxide	.018%	Aluminum Oxide	.012%	Calcium	.004%	Magnesium	.003%	Sodium	.001%	Potassium	.001%	Titanium	.001%	<p>Silica Sand Top Dressing Screen Analysis</p> <table border="0"> <tr><th>Mesh</th><th>% Retained</th></tr> <tr><td>30</td><td>2.0</td></tr> <tr><td>40</td><td>11.0</td></tr> <tr><td>50</td><td>25.0</td></tr> <tr><td>70</td><td>51.8</td></tr> <tr><td>100</td><td>10.0</td></tr> <tr><td>140</td><td>.2</td></tr> </table>	Mesh	% Retained	30	2.0	40	11.0	50	25.0	70	51.8	100	10.0	140	.2	
Silica	99.941%																															
Iron Oxide	.018%																															
Aluminum Oxide	.012%																															
Calcium	.004%																															
Magnesium	.003%																															
Sodium	.001%																															
Potassium	.001%																															
Titanium	.001%																															
Mesh	% Retained																															
30	2.0																															
40	11.0																															
50	25.0																															
70	51.8																															
100	10.0																															
140	.2																															

P. O. Box 78 • Larsen, WI 54947 414-667-4792

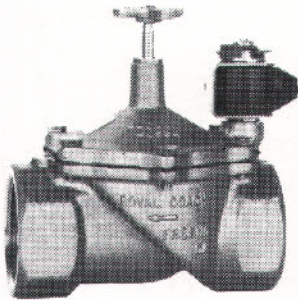
AMETEK
TURF BOXES

Manufactured In
Sheboygan, Wisconsin

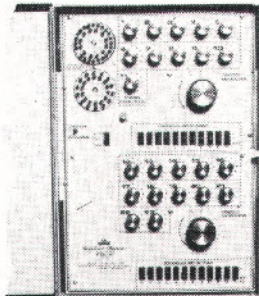
Ametek irrigation boxes are warehoused regionally throughout the U.S. and Canada

IRRIGATION EQUIPMENT

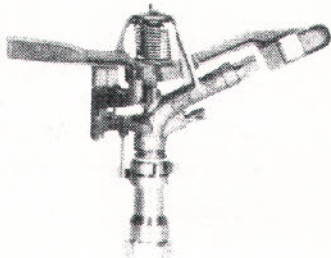
and IRRIGATION DESIGN CONSULTATION



Electric Valves



Controllers



Impact Sprinklers
FULL/PART CIRCLE

Buckner[®]
Royal Coach

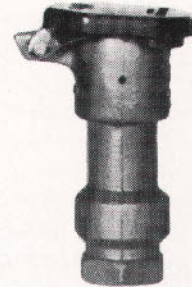
- Design
- Free Budget Figures
- Pump Renovations
- New Pump Packages
- Green & Tee Systems
- Anything to Move Water
- Parts / Repair for Most Makes

TOLL FREE

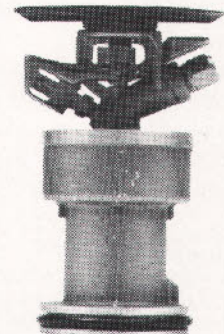
Wisconsin Number
1-800-323-2352

"LEADER IN THE IRRIGATION
DISTRIBUTION FIELD"

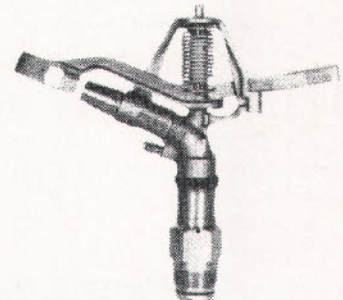
centuryrainaid



Quick Connect Valves



10094 for TORO
650, 670



Impact Sprinklers
FULL CIRCLE

Call us first for all Makes of Irrigation Equipment

centuryrainaid

Buckner Golf Group
Bob Manley

Century RAIN-AID
341 Lively Blvd.
Elk Grove Village, IL 60007
1-800-541-7450

Buckner Golf Group
Scott MacIntyre