(Continued from page 39)

took place in the National Park Service Visitor Center at the Muir site. The stamp is shown here.



Year-end (1997) golf course statistics from the National Golf Foundation crossed my desk in mid-March. They always amaze and impress me, primarily because of the way the Midwest in general and Wisconsin in particular shape up in the world of golf.

Wisconsin finished 1997 in fifth place in new golf course openings with 19. The Middlewest dominates with Michigan, Indiana, Ohio and Minnesota also falling in the top 10. Wisconsin now has 489 golf courses, placing it in tenth place among the states. Florida is first. As of December 31, 1997, Wisconsin had another 29 golf courses under construction, putting us in tenth place in that department. Golf is healthy here.

The NGF survey revealed some other interesting facts:

1. It took an average of 21.5 months for the 18-hole regulation facilities that opened in 1997 to go from ground-breaking to ribbon-cutting.

2. The majority (85%) of all courses built in 1997 were public — either daily fee or muni. This is a trend that has continued for 50 years. Seventy percent of all courses in America today are open to the public.

3. The average weekend fee for public courses opening in 1997 was \$57. It included a cart. The average weekend fee for all public courses was \$37.

4. Twenty percent of all courses built in 1997 were 9-hole stand alone facilities. Overall, 9-holers account for 30% of U.S. golf courses. I've never kept my admiration for Governor Tommy Thompson a secret. He's a small town guy who has worked hard for Wisconsin for decades, has led our state to great prosperity, tackled big problems head on and solved them, and he may run for an unprecedented fourth term. He can almost walk on water.

But what he needs to do is walk on some grass, real grass. He's instructed a state building commission member, Rep. Tim Hoven, to head a task force to look into the possibility of replacing Camp Randall Stadium's artificial turf with grass. The current artificial turf is nearing the end of its useful life and there will be an opportunity to make the switch in the next few years. By the year 2000, projections are that only Wisconsin and Minnesota will have artificial surfaces for football.

Tommy wants input — "sports fans, tell us how you feel about it," he said on March 19th.

OK. Here's what I think. Leave it with an artificial surface. It's a busy (Continued on page 42)



(Continued from page 41)

field - concerts, Big 10 football, collegiate soccer games, intramural sports, high school football games, UW Marching Band practices, and more. The field would be mud by mid-September. One rainy game and the field could be trashed for the rest of the season. I've seen it happen to Lambeau Field more than a few times. A game between two teams playing in the mud is hardly a keen competitive event. The UW Marching Band is one of the country's best; I would hate to see them charge onto the field in white spats to put on a halftime show ankle deep in mud. I am not exaggerating.

I clearly remember when the field was grass. During my undergraduate years in the 1960s it was ugly, and Peter Miller had me drive an IH 240 tractor and a John Bean sprayer from Nakoma to Camp Randall to spray it in mid-summer for brown patch. It was in poor shape even when it wasn't in use. I'd not have confidence circumstances would be any different these days. Arguments are made that grass fields reduce injuries. That is likely true, but I am not aware that UW athletes suffer anymore injuries than those from colleges playing on grass. I think it is more a function of how "soft" the artificial field is. Wisconsin football coach Barry Alvarez opposes a change from artificial turf to grass, and AD Pat Richter says he is "open" to the idea. If you want to express your opinion to the governor, call 266-121 and let him know what you think.

DON'T FORGET TO MARK YOUR CALENDAR!!!

Who: You

What: WTA's Summer Field Day Where: O.J. Noer Turfgrass Facility When: Wednesday, August 12, 1998



Registration information will be arriving within the next several weeks. If you have questions, contact Audra at **608-845-6536**.



We attended the snow mold field day at the Noer Facility on April 6; it was a worthwhile couple of hours.

The Noer has a different look that time of the year, which inspired lots of questions for professors Kussow and Stier, who were both in attendance.

We checked out Jeff Gregos' extensive snow mold plots, and then looked at different grass varieties as they came out of winter, learned of Wayne's runoff experiences from



We got John Stier started talking about *Poa supina;* he knows more about it than anyone else in the country.



Jeff Gregos had a captive audience, albeit a small one. The Noer meeting included faculty Kussow, Stier and Andrews in the foreground.

spring rains and snow melt, and studied some of the bentgrass work.

I haven't heard how attendance was at the other venues, but those who missed the one at the Noer missed a very worthwhile event.

Dr. Chuck Koval spent decades in UW Extension, helping people like you and me with turfgrass insect problems. He's been under the weather of late. If you'd like to send him a card or a note, here is his address:

Charles F. Koval 3406 Viburnum Drive Madison, WI 53705

That's it. Enjoy these best days of Wisconsin weather. As Garrison Keillor says, "Be brave, be cheerful and look for the best."

Championship Turf



The Super Bowl Champion Green Bay Packers have improved Lambeau field by installing a new Sports Turf® system to provide the best surface possible. To insure strong, tough turf, the Packers chose fertilizers from **Spring Valley** Turf Products. **Spring Valley** is proud to be the choice of the Packers!

SPRING VALLEY® The Fertilizer Choice of the Packers 1-800-635-2123



HERE. THERE. EVERYWHERE.

How'S THAT FOR APPLICATION GUIDELINES?



On greens. On tees. On fairways, roughs, flower beds, transplants — even in your divot mix. Milorganite delivers outstanding results for a uniform playing surface. No other fertilizer is easier on plants or simpler to use. Milorganite's slow release, organic nutrients won't burn or cause a flush of growth. Plus, it's high in micronutrients such as iron to promote dense, vigorous turf. And Milorganite resists leaching, for a sound environmental profile. So call your distributor today, or call Milorganite's turf professionals direct at **1-800-304-6204**. It's easy.

The Cutting Edge



MUSSEL MANIA — WHAT IS IT?

By Andy Kronwall

Lake Geneva Country Club is an 18-hole private country club nestled along the southern shore of Geneva Lake. The club was established in 1896, with construction of the golf course beginning that year. The construction of the course took considerable time because the work was done by hand and with horses. Nevertheless, by 1898 eighteen golf holes were completed. During the depression years laborers were hired for \$1 per day to install drainage lines and an irrigation system. Three water towers were constructed and a pumphouse was built along the lakeshore to utilize the pristine waters of Geneva Lake. Although the irrigation system has been updated several times, we still use Geneva Lake as our sole water source for golf course irrigation.

Zebra Mussels were first observed in Geneva Lake on rocks and pier posts at the east end of the lake in the fall of 1995. By mid-summer 1996 moderate sized colonies had spread to about the mid-point of the lake (the narrows), and smaller colonies were observed at the west end. The lake is nine miles long and the current flows from west to east, so it is presumed that the original contamination took place on the east end of the lake and has slowly moved against the current to the west end.

Zebra Mussels (*Dreissena polymorpha*) are small clam shells (1/2 - 2 inches) which attach to any solid object with tufts of fiber called "byssal threads." They are native to the Caspian Sea region of Asia, and were introduced into North America in the mid 1980's via transoceanic ships that discharged ballast water into Lake St. Claire, near Detroit. Tolerant of a wide range of environmental conditions, Zebra Mussels have extended their range to parts of all the Great Lakes and much of the Mississippi River. They are beginning to infest inland lakes and rivers as well, primarily transported by careless boating enthusiasts and waterfoul.

Quagga Mussels (Dreissena bugensis) are related to the Zebra Mussel, and much of the information I am presenting applies to the Quagga Mussel as well. The Quagga Mussel has only been found in the St. Lawrence Seaway, Lake Ontario, Lake Erie, and Saginaw Bay in Lake Huron, so for this article I will only refer to the Zebra Mussel.

I became concerned about water quality in Geneva Lake not only because it's the source of water for my golf course irrigation, but my family uses it for boating, fishing, and swimming. Geneva Lake is also vital to the economic success of my community, bringing in millions of tourist dollars annually.

I soon learned the seriousness of this mussel menace when my new irrigation pumping station was not working properly. I disassembled a high pressure relief valve and found it to be plugged with Zebra Mussels. It was then that I decided to learn as much as I could about Zebra Mussels. At that point in time I had a new irrigation system plan, and installation of the new pump station was already completed. Installation of the rest of the irrigation system was to take place in the fall of 1998. I didn't want to contaminate the new system, so we put all plans on hold until we formulated a strategy for Zebra Mussel control.

The mature female Zebra Mussel will produce up to one million eggs per season. Egg release starts when the water temperature warms to about 54 degrees Fahrenheit and continues until the water temperature drops to below 54 degrees Fahrenheit. Eggs are fertilized outside the mussel's body and within a few days develop into freeswimming microscopic larvae called veligers that soon develop miniature bivalve shells. Mussels become adults when they reach sexual maturity, usually within a year. Zebra Mussels are bivalve shells that use cilia on their gills and body to pull water into the shell cavity through an "incurrent siphon" to extract particulate matter. The newly particle-free water is then discharged out the "excurrent siphon," as are feces from the intestine and urine from the kidneys. Each adult mussel is capable of filtering one or more liters of water each day.

Since the Zebra Mussel is not native to this region it has had a negative impact on our ecosystem. This will affect the way we use our lakes and streams for irrigating golf courses, food crops, and industry such as power plants and paper mills.

HOW WILL THEY AFFECT YOUR COURSE?

Zebra Mussels will attach themselves to anything that is not toxic to them, including attaching to other Zebra Mussels. This characteristic will have the biggest impact on golf course irrigation systems. Zebra Mussels are sucked into the intake pipes of our irrigation system when (Continued on page 47)



The One and Only.

HERITAGE An Ounce of Prevention...

HERITAGE is a highly flexible fungicide that exhibits both preventative and curative activity against most turfgrass diseases, plus the following advantages:

- · Improves turf quality
- · Controls brown patch, Pythium, take-all patch, summer patch, anthracnose and snow mold
- · Reduced risk to environmental resources
- · Low risk toxicological profile
- · Low rates, extended spray intervals
- · Novel mode of action

Anthracnose: (Colletotrichum graminicola) on 80% Annual Bluegrass, 20% Perennial Ryegrass



Dr. Don Scott, Purdue University, 1995 • Also isolated from plots: 2 species Rhizoctonia: 3 species Pythium; and several species Phi

100 80 Fore Percent Control 60 TAGE SOWG 40 20 0z/1,000 sq. ft. 0.4 0.2 3.0 0.25 1.0* 4.0* 0.2 4.01 8.01 Number of Applications 2 4 2 2 4 Application Interval (days) 28 14 21 28 14 14 14 Final Reading 12 DAA2 8 DAA4 19 DAA2 12 DAA2 8 DAA4 8 DAA4 8 DAA4 Dr. Pat Sanders, Penn State University, 1994 US 66-94-P356

ZENECA Professional Products

Always read and follow label directions carefully. HERITAGE® and DACONIL® are registered trademarks of a Zeneca Group Comp Aliette® is a trademark of Rhône-Poulenc Ag Company. Banne®, Sentine® and Subdue® are trademarks of Novartis Corporation. Cleary% is a trademark of W.A. Cleary Chemical Company. Eagle® and Fore® are trademarks of Rohm and Hass Company. Prosta® is a trademark of AgrEvo. Rubigand® is a trademark of Dow AgrOSciences. ©1998. Zeneca Inc. Zeneca Professional Products is a business of Zeneca Inc.

Once you learn about the powerful, preventative

Heritage

protection and its fit with your best management practices, you'll agree that it's time to change the course of your turfgrass disease management program, with HERITAGE.

For more information, call Daniel Wickham at 714-858-5415, or contact your authorized Zeneca Distributor, or call Zeneca Professional Products Toll Free at 1-888-617-7690. www.zenecaprofprod.com

Pythium Blight (Pythium aphanidermatum) on Perennial ryegrass



Dr. John Watkins, University of Nebraska, 1996

Summer Patch (Magnaporthe poae) on Kentucky Bluegrass

100 80 Control 60 TOWF Percent 40 agle 20 6% 0z./1,000 sq. ft. 0.6 0.4 0.2 4.0 0.33 0.75 Number of Applications 3 3 3 3 3 4 Application Interval (days) 14 28 28 28 28 28 Final Reading 19 DAA 3 33 DAA 4 19 DAA 3 19 DAA 3 19 DAA 3 19 DAA 3 Dr. Bruce Clarke, Cooke College, Rutgers University, 199-US 66-94-P362





CHANGING THE COURSE OF DISEASE CONTROL

Brown Patch (Rhizoctonia solani) on Colonial Bentarass

(Continued from page 45)

they are in the free-swimming veliger stage (white blood cell size). They then attach themselves to the pipe and begin to grow. The irrigation cycles continue to bring in food needed for their survival and take away the waste generated by them. The perfect environment! As weeks pass, the pipe becomes lined with Zebra Mussels, and the second generation attaches to the first generation. As this process continues, the pipe becomes so restricted the water supply is reduced to only a fraction of its original capacity. Another problem which is typically noticed first is the clogging of small orifices of the metering valves and sprinkler heads. Each unit has to be disassembled. cleaned, and reassembled, which uses hundreds of man hours and costs immeasurable inconvenience. If undetected and/or steps are not taken to control Zebra Mussels. they could permanently cripple a golf course irrigation system in a very short period of time.

Currently there is not much documentation of successful Zebra Mussel control methods for golf course irrigation systems. Most research has been aimed at power plants, paper mills, and fire protection systems. I used research done by universities and corporate studies, as well as discussions with WI DNR, US Sea Grant, and local environmental specialists to come up with a Zebra Mussel control plan. Some of the best information came from Canadian and Michigan Golf Course Superintendents who have been dealing with Zebra Mussels since 1988. I originally made contact with those superintendents by posting a question on the GCSAA Internet site. The internet is an excellent source of information for any subject you can imagine.



• Fall 1996 & Spring 1997 Dates are Available

Within closed loop systems, injection of molluskicides have produced some of the best results in Zebra Mussel control. Some that have been tried are Chlorine @ 0.25 ppm (turfgrass injury at >50 ppm), Calgon H-130 @ 5 ppm, Potassium @ 30 ppm or 40 ppm, and pH regulation. All of these methods were tried individually and had varied degrees of success.

I chose to try a combination of pH control and potassium injection. This method had not been tried yet to the best of my knowledge, but I felt it would work best for my situation. The agencies involved thought that my suggestion of pH control by monocarbamide dihydrogensulfate (MCDS is marketed commercially under the name of pHAIRWAY) injection and potassium injection could be a viable control system. I added two Neptune injection pumps with Strantrol series 840 controllers into my irrigation pump station. With this system the pH level is monitored through a sensor inside the irrigation system. It will inject MCDS only during a pumping cycle to correct the pH level according to my chosen setting (6.5). Zebra mussel physiology requires an environment with a pH of more than 7 to survive. The injection system for the potassium is metered for 30 ppm. My source for potash is through a local farm service supplier and is very inexpensive. I chose this system based on my needs to control the zebra mussels, but also considered some of the additional benefits of correcting the pH level of my irrigation source, which is 7.8. The ability to inject potassium was also attractive because my soil tests consistently show deficiencies in potash.

Since the installation of this system I haven't had any clogging of irrigation equipment due to mussels. Whether this system will continue to be effective in controlling Zebra Mussels only time will tell. I am confident that what I am doing is the best available solution to my immediate problem with the least environmental impact. Since there are so many unknowns in Zebra Mussel control, I consider this a short term solution to a long term problem. I am currently working on a plan to create a lake on our course as well as installing a high volume well to use for water supply for my new irrigation system. If contamination were to occur in this much smaller lake, I will be able to control them in this micro-environment without the use of any molluskicides.

(Continued on page 49)

FOR SALE

1990 Jacobsen Turfcat Diesel T4220 72" Rotary Mower hydraulic lift, 600 hrs. *LIKE NEW*

\$6,200.00 or Best Offer

Contact Don Butzin (414) 544-1555 **CUT BOTH WAYS** 0 0 0

You'll trim more than grass with Kohler's fuel-efficient Command™ PRO SERIES engines.

Gas-saving KOHLER Command engines feature overhead valves for cleaner, more complete fuel combustion. That means a savings of hundreds of dollars annually in fuel costs. No carbon build-up. Fewer emissions. Plus fewer refueling stops in a busy, 8-hour mowing day. All without sacrificing torque, power and reliability.

Time to get cuttin' with Kohler. For more information about the complete line of energy-saving Command PRO SERIES engines, write Kohler Co., Engine Division, Dept. GR, Kohler, Wisconsin 53044, or call 1-800-544-2444.



(Continued from page 47)

I have given an extremely brief overview of the information I was able to obtain and how I applied it to my situation. For additional information on Zebra Mussels, you can contact the Wisconsin Sea Grant Advisory Service, Cliff Kraft (414) 465-2795, or Michigan Sea Grant Communica-

tions Office at (734) 764-1118. For those that are on-line there are a few sites dedicated to Zebra Mussels containing large volumes of information. A good start is www.nfrcg.gov/zebra.mussel. Much more information has been published since I did my research, so I would suggest that if you are now pumping from a lake, stream, or irrigation pond you review the new information.

Fort Atkinson

UPCOMING EVENTS

May 6	Snow Mold Field Day	Gateway GC, Land O' Lakes
May 11	WGCSA May Meeting	Cedar Creek CC, Onalaska
May 20	SuperPro	Lawsonia GC, Princeton
June 5	John Deere Tourney	Old Hickory CC, Beaver Dam
June 8	WGCSA June Meeting	Browns Lake GC, Burlington
July 14	WGCSA July Meeting	Monroe CC, Monroe
Aug 10	WGCSA August Meeting	Edelweiss Chalet CC, New Glarus
Aug 12	WTA Summer Field Day	Noer Facility, Verona
Sept 21	WGCSA September Meeting	Koshkonong Mounds CC, Fort Atl
Oct 2, 3	WGCSA Couples Weekend	Riverview CC, Appleton
Oct 12	WGCSA October Meeting	Timberstone GC, Kingsford, MI
Nov 3, 4	Wisconsin Golf Turf Symposium	Milwaukee
Jan 12, 13	WTA EXPO	Marriott Middleton

Spray in the wind with the WINDFOIL





- Reduce Environment, Public Pesticide Exposure
- Increase Productivity / Stay on Schedule
- Maintain on Target Applications
- Increase Public Confidence
- Adapt to your Current Sprayer
- Current Customers Thru-out Wisconsin



Wild Attraction®

Native Grasses, Wildflower Seed & Plants

Certified for Purity, Germination & Origin by Wisconsin Crop Improvement Association Foundation seed sources from remnant Midwest prairie tracts

Naturally beautiful

Over 75 Species of nursery-grown seeds & plants from AGRECOL Corp.

- Prairie
- Savanna
- Wetlands
- Woodlands

Ask your distributor for Certified Wild Attraction Seed.

Seed & Plant Distributors

Prairie Nursery Westfield, WI 800 476-9453

J & J Tranzplant Aquatic Nursery Wild Rose, WI 800 622-5055

ION Exchange Harpers Ferry, IA 800 291-2143

Prairie Future Seed Co. Menomonee Falls, WI 414 820-0221

Shooting Star Native Seeds Hwy 44 W. & County Rd. 33 P.O. Box 648 Spring Grove, MN 55974-0648 507 498-3994 L.L. Olds Seed Co. (seeds only) Madison, WI 800 356-7333

Prairie Moon Nursery Winona, MN 507 452-1362

Prairie Ridge Nursery Mt. Horeb, WI 608 437-5245

Landscape Naturally Sycamore, IL 815 899-7574

Plantscapes (plants only) Madison, WI 608 223-3564 800 807-7526

Wild Attraction, is a registered trademark of AGRECOL, Corp. 1984 Berlin Rd Sun Prairie, WI Tel 608 825-9765 Fax 608 825-9398