The Clubhouse at Oconomowoc Golf Club

and his wife Jamileen have been married for 5 years and they have two daughters, Dayle Patricia who is 2 and the newest member of the family Riann Adelaide who is two months. When asked of his current hobbies family and turf were at the top along with fishing and following the Green Bay Packers.

WGCSA Past President Scott Schaller not only set a great example for Dustin as an employer but also in association service. Dustin joined the WGCSA Board of Directors in 2001 and has moved through the ranks to President of the 500 member organization. He feels one of the challenges for the board is to find members willing to donate their time and talent to the WGCSA while making family and work high on their priority list. Dustin said joining the board requires extra effort outside the normal day, but so far has found the experience rewarding.

His personal challenge as President of the 78 year old organization is to help ensure each member is getting the value they deserve from the association. To achieve this Dustin believes the board can provide a better awareness of all the services and benefits that the WGCSA provides to its membership. As important as the communication of the benefits, those benefits must be delivered professionally and efficiently. As the WGCSA expands into new services Dustin will be careful not to let the quality of the current services drop.

This editor believes the Wisconsin Golf Course Superintendents Association is in great hands with Dustin Riley leading the current mix of board members. I know they will make a great team. I am lucky to be able to say, "I knew him when" he was just a bright eyed whipper snapper looking for summer work.

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How to Interpret Your Soil Test Potassium Levels

By Dr. Doug Soldat, *Department of Soil Science, University of Wisconsin-Madison*

NR-151 has shoved the practice of soil testing into the spotlight. Many superintendents have been analyzing their soil consistently for several years. However, there is a substantial group of superintendents out there that will be looking at soil test reports from their courses for the first time. There is also a sizeable group of superintendents that has taken soil tests before, but do not place much emphasis on the practice. The primary focus for soil testing for NR-151 has been on phosphorus levels, with little attention paid to the soil potassium levels. This is because there are no known negative consequences of elevated potassium levels in ground or surface water. Properly interpreting a soil potassium test is not as straightforward as it might seem, and therefore the purpose of this article is to discuss the promises and pitfalls of using soil tests to schedule potassium applications.

Potassium is held in the soil rather tightly by negatively charged, "exchange sites." These sites are predominantly associated with clay and organic matter particles. The collective amount of negatively charged exchanges sites is called the cation exchange capacity or CEC. A cation is shorthand for a positively charged molecule. Important soil cations include hydrogen (H^+), potassium (K^+), calcium (Ca^{+2}), magnesium (Mg^{+2}), and sodium (Na^+). The cation exchange capacity of a soil is an indication of the quantity of nutrients that the soil can retain. However, measurement of CEC is tricky business and if the soil contains any appreciable amount of calcium carbonate, CEC is often over-estimated by even the most reputable laboratories. Therefore, the most practical way to estimate CEC is by classifying the soil into one of two groups: (1) fine textured soils (loams, silt loams, clay, etc) which can be assumed to have adequate CEC and (2) high-sand content soils which have a low CEC.

For high-sand content root zones (those we can assume have a low CEC), there are two important things to remember. First, large applications (>0.5 lbs K_2O/M) cannot be retained by the soil. The graph in Figure 1 demonstrates this for a USGA green in Utah. The different lines represent the various amounts of potassium applied each year. The line with the open circle is 100 kg K ha^{-1}, which is equivalent to 2.5 lbs/M of K_2O. Therefore the various annual potassium rates in this study were 0, 2.5, 5, 7.5, and 10 lbs/M. Potassium was applied in six equal doses during the growing season. That means the 2.5 lb/M rate was applied in six applications of 0.41 lbs/M.

When you look at this graph, you notice that the increases in soil test K are not following the increase in fertilizer application. If they were, we would expect to see twice as much soil K in the 400 kg ha^{-1} line (10 lbs/M) than the 200 kg ha^{-1} line (5 lbs/M). Instead, we see that the increase in soil K is substantially less. In fact, I would say that there is little benefit to applying more than 5 lbs K_2O/M during the year. It could also be concluded that individual potassium applications should not exceed 0.8 lbs/M during the year. Sand has a low CEC, and a significant fraction of the applied potassium is being lost to leaching. For fine textured soils, we would expect to see much greater potassium retention.

What about all that peat moss that was added to your USGA green to increase the moisture and nutrient retention? Well, believe it or not, the nutrient retention part is overrated. Peat moss additions

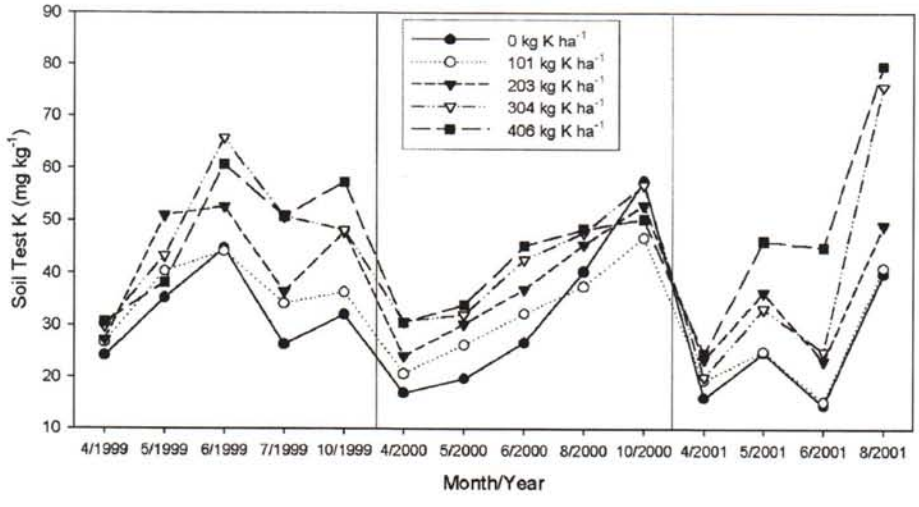

Figure 1. Seasonal changes in Olsen-extractable K during 1999-2001 from a sand putting green in Utah fertilized with various rates of potassium (from Johnson et al., 2005).

do to little, if anything, to improve the nutrient holding capacity of sand-based root zones. Here is some evidence. From 2002 to 2004, Dr. Kussow and I collected the leachate from an experimental putting green at the O.J. Noer Center. We analyzed that leachate for potassium and found that throughout the entire study period 26% of the applied potassium leached from the pure sand root zone, while 25% of the potassium fertilizer leached from the peat-amended root zone. Not exactly a confidence inspiring difference.

Back to Figure 1. The second thing to notice about this graph is that after each winter, all soil test levels drop dramatically. This result can be attributed to snowmelt and spring precipitation that leaches most of the applied potassium out of the root zone. The take-home message here is if you are using soil tests to schedule potassium applications, spring - not fall – is the ideal time to pull the cores.

For native mineral soils in Wisconsin, soils that we can safely assume have adequate CEC, soil cores can be pulled virtually anytime and the soil test levels should remain stable for a period of at least three years. Furthermore, we can have more confidence that larger applications of potassium will be retained efficiently.

How much potassium does turfgrass need?

If Frank Rossi is reading this, he is rolling his eyes right now. Frank and his co-workers recently demonstrated that potassium requirements are probably lower than what has been previously thought for creeping bentgrass on sand greens (Woods et al., 2005). They applied a wide range of potassium to plots on a sand-based putting green for three years. To one set of treatments, they applied no potassium for three years, which resulted in soil potassium levels that would be considered very low by any soil-testing lab. Throughout the study, no differences in ball roll among the various application rates were detected. They also found less gray snow mold damage, and faster recovery from plots receiving little or no potassium for three years. In addition, they reported significantly greater root mass between 4 and 8 inches from the plots receiving little to no potassium. They speculate that the extra root mass might be due to the bentgrass sending out deeper roots in search of potassium.

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Research done by Dr. Kussow and Steve Houlihan has also found that healthy turfgrass can be grown on soils that might have been described as "low" in potassium just a few years ago. Take a look at Figure 2. This shows the amount of potassium in turfgrass leaves compared to the amount of Bray-1 extractable potassium in the soil. Each blue dot represents a single site where clippings were taken and analyzed for potassium content and a soil sample was pulled and also analyzed for available potassium. These data points include many different types of soils. If you look at the data points above the 50 ppm soil test level, you'll notice that the tissue content ranges from 1.5 - 3%, almost identical to the range that you notice for all the higher values of soil potassium. However, 50 ppm is considered by many labs to be between very low and low.

In conclusion:

1. Large applications of potassium to sand greens are not retained, and whatever amount was applied last fall will likely have been washed out of the root zone by spring.
2. For mineral soils, large potassium applications (1 lb/M) can be efficiently retained, and soil sampling time is not critical.
3. For sand-based root zones, soil samples should be taken in the spring when levels are likely to be at their lowest
4. Recommendations for potassium fertilizer are conservative, current and ongoing research has indicated that good turfgrass growth can be maintained at "low" soil potassium levels.

References

Johnson, P.G., R.T. Koenig, and K.L. Kopp. 2003. Nitrogen, phosphorus, and potassium responses and requirements in calcareous sand greens. Agon. J. 95:697-702.

Woods, M.S., Q.M. Ketterings, F.S. Rossi, and A.M. Petrovic. 2006. Potassium availability indices and turfgrass performance in a calcareous sand putting green. Crop Sci. 46:381-389.

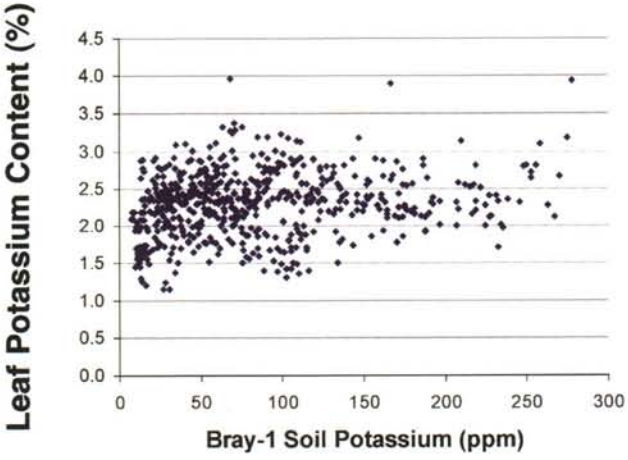

Figure 2. Relationship between soil test potassium and potassium in turfgrass clippings. Each of the approximately 600 data points represents a single site. Data collected and analyzed by Steve Houlihan and Wayne Kussow throughout Wisconsin.

Coming Events

April 21 • WGCSA Meeting
Geneva National Golf Club, Lake Geneva, Host- Kevin Knudtson

May 28 • WPGA/WGCSA Super Pro
Northern Bay Resort, Arkdale, Hosts- Ryan Ranguette and Scott Anthes

June 9 • WGCSA Meeting
Evergreen Golf Club, Elkhorn, Hosts- Bill Rogers and Mike Schmeiden

July 7 • WGCSA Meeting (Tournament Meeting)
Watertown Country Club, Host - Mike Upthegrove

July 22 - WTA Field Day
OJ Noer Research Facility, Verona, WI, Contact - Tom Schwab

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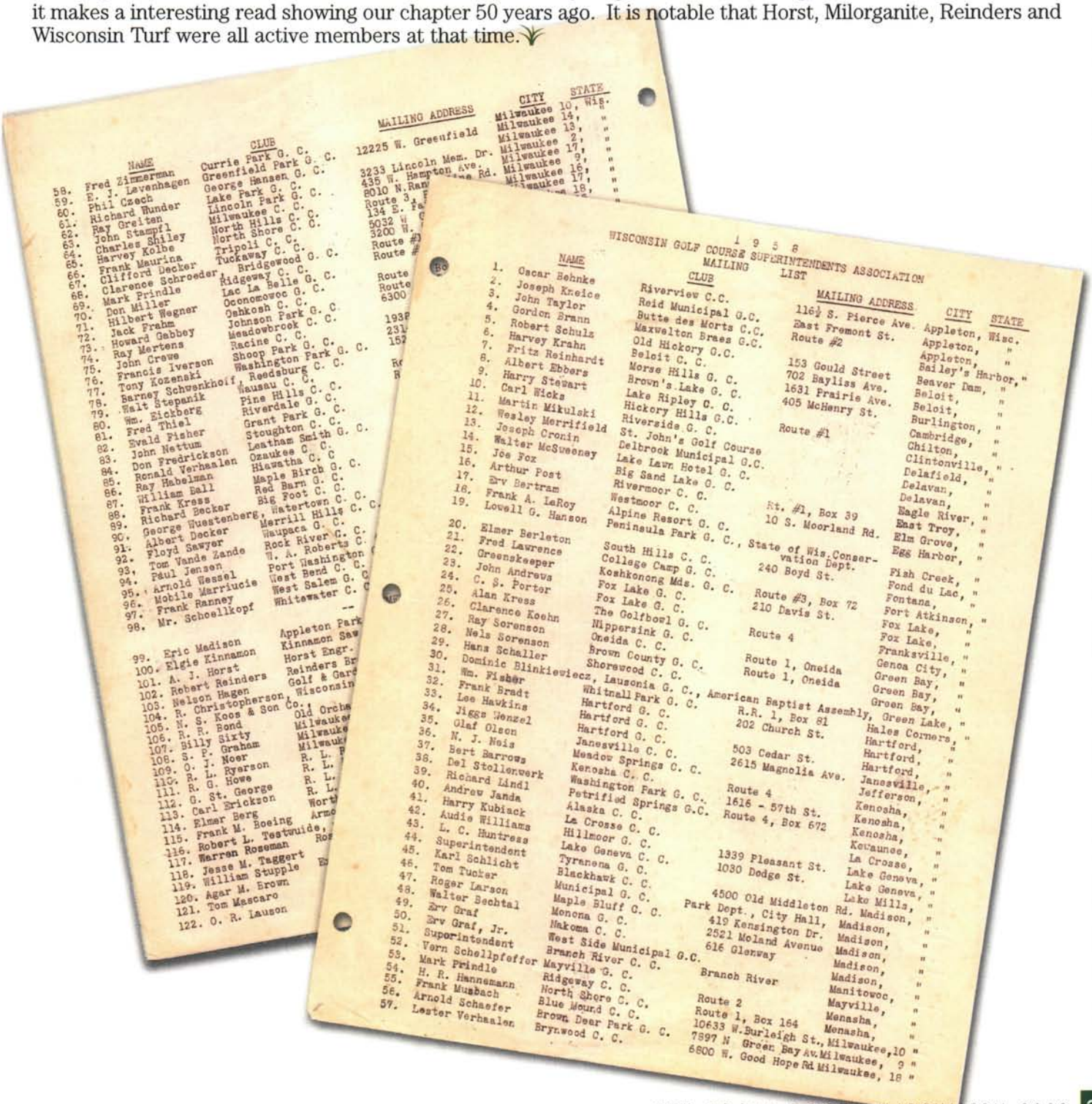
1958 WGCSA Directory

Back In Time will be a new feature to *The Grass Roots* on a regular basis. The WGCSA history is informative and important to a new generation of members. If you have an item from your archives about WGCSA or your club that you think may be of interest to our readers please feel free to contact me.

This issue we are highlighting the association mailing list from 1958. The list previously was given to Monroe Miller by Rod Johnson in 1988 and was featured in the July August issue. Monroe passed it on to me and I feel it makes a interesting read showing our chapter 50 years ago. It is notable that Horst, Milorganite, Reinders and Wisconsin Turf were all active members at that time.



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MAILING LIST

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2.	Joseph Kneice	Reid Municipal G.C.	East Fremont St.	Appleton,	"
3.	John Taylor	Butte des Morts C.C.	Route #2	Appleton,	"
4.	Gordon Brann	Maxwelton Braes G.C.		Bailey's Harbor,	"
5.	Robert Schulz	Old Hickory G.C.	153 Gould Street	Beaver Dam,	"
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9.	Harry Stewart	Lake Ripley C. C.		Cambridge,	"
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11.	Martin Mikulski	Riverside G. C.		Clintonville,	"
12.	Wesley Merrifield	St. John's Golf Course		Delafield,	"
13.	Joseph Cronin	Delbrook Municipal G.C.		Delavan,	"
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15.	Joe Fox	Big Sand Lake G. C.		Eagle River,	"
16.	Arthur Post	Rivermoor C. C.	Rt. #1, Box 39	East Troy,	"
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18.	Frank A. LeRoy	Alpine Resort G. C.		Egg Harbor,	"
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20.	Elmer Berleton	South Hills C. C.		Fond du Lac,	"
21.	Fred Lawrence	College Camp G. C.		Fontana,	"
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24.	C. S. Porter	Fox Lake G. C.		Fox Lake,	"
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28.	Nels Sorenson	Brown County G. C.	Route 1, Oneida	Green Bay,	"
29.	Hans Schaller	Shorewood C. C.	Route 1, Oneida	Green Bay,	"
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33.	Lee Hawkins	Hartford G. C.		Hartford,	"
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57.	Lester Verhaalen	Brynwood C. C.	6800 W. Good Hope Rd.	Milwaukee,	18 "

Winter Fantasyland

By Pat Norton, *Golf Course Superintendent, Nettle Creek Country Club*

Over the months of the winter just completed...I came to realize that it was all a fantasy...it was all beyond the possible...once again I had to accept that it just would not happen...and my golf course dreams once again were crushed. Reality soon set in...as the rush of spring finally arrived...and wintertime golf fantasies faded out and were replaced by the everyday golf course routine.

Of course, what is being referred to the opening paragraph is that set of ideas that were allowed to bubble up in the mind of superintendents everywhere during the winter months. We had quite a few weeks of relative down time...which gave us the chance to reflect...and regenerate the creative juices. The juices soon overflowed out of our brains and out onto the shop floor as we were forced to decide on winter work priorities...getting everything repaired, refurbished, replaced, repainted, retooled, reground...overhauled, oversprayed, overtime, overcooked...at times a bit overwhelming!

All had to be accomplished within a new operating budget that each superintendent carefully prepared...recommended and agreed to...only to quickly find out as winter and the shop work slowly progressed...that every piece of existing equipment needed 25-40% more $$$ invested into parts and shop occupation time...than was ever expected. So much for the idea of staying within budget...

Even with the significant increase in equipment repair $$$ budgeted here for '08...courtesy of GolfVisions...we found it to not be a problem spending it all.

The thinking then naturally morphed...as it does every winter... into fantasizing about acquiring new equipment...and eliminating some of the work that went into preparing this existing fleet for yet one more season of fighting the golf course battle.

I felt like the commander of an outmatched army...trying to fight with tanks that did not want to fight anymore. I felt like Merlin the magician...waving my spray can around and around...trying to conjure up a new spell that would transform this old, tired equipment into something new, something beautiful, something orange, red, or green.

Visions of replacing those worn out CarryAlls...those ancient...almost dead Toro 3100 tee mowers...pestered me as we contemplated the process of machinery rescue and resusitation. Trouble is, my talents lie elsewhere. I was pretty good all winter long in the process of triage...of deciding the priorities concerning machinery R&R. Making it all come back to life meant for a long, slow recovery...with myself simply an observer, an expeditor, and a decision maker. The patient will probably survive in spite of my best intentions...

Our Toro 5100-D fairway collar mower...long a valiant workhorse here...has received over the years...a new set of reels, numerous changes of bedknives, a replacement engine, and a replacement transmission. *Jump starting it every morning last season made us all feel like doctors in the ER applying their paddles to a human victim. That machine used to literally jump up off of the floor about six inches as it tried to come back to life...and perform its mowing duties just a few more times. We just wanted to make sure that all of the working juice was sucked out of it before we consigned it to the scrap pile...and possibly replace it.*

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The discussion here concerning equipment replacement is our version of the old joke about the guy who says he's still using the same carpenter saw after all of these years...four or five different blades and four or five different handles...but still the same saw, right?

We all started this creative thinking process back over the Thanksgiving weekend as we pondered the season just completed...and the upcoming budget year. Budget time and early winter shop work in December naturally progressed into that normal off season feeling of wanting to junk any piece of equipment older than five years...and buy all kinds of new equipment.

It would be sort of like a present for the holidays...with the unbreakable rule being that any piece that was a serious problem last season...would be unquestionably junked or traded in before the first of the year.

I think that I would much rather get a new greens mower...or maybe a semi load of B&B trees...for Christmas than some old sweater or funky tie. I would be willing to trade my beloved books received as presents...in exchange for that new John Deere turf tractor sitting in the showroom at Hogan Walker Implement. Or maybe the company would let me trade in some of my vacation time for a set of greens rollers...and have them sitting underneath the Norton family Christmas tree...waiting for dear old Dad.

We are now on the doorstep of spring here in the upper Midwest. It is also the time of year in which superintendents everywhere start dreaming about nature...of getting outside...and getting back to work. Every dream we have is tinted green...and everything is already in superb, beautiful shape out on the course.

We dream of what our courses should look like in their ideal state...with all of the longed for improvements to the course already in place. Everything is magically in place. Trees never planted are eighty foot wonders...while bunkers never installed look so good...so perfect...and so numerous! All of the course design changes that Lohmann ever proposed...have been completed by Scotty Schaul on his dozer that never runs out of fuel and never quits shaping. In a dream...it all just happens so easily...so completely...with never a thought of money needed to accomplish it. Maybe Bob will do some *'pro bono'* work down here at little old NCCC! Ah...what a beautiful golf course fantasy!

The reality is that today is March 4th and somebody is tardy getting their contribution to the Grass Roots sent into our new editor! I do get to sit here keyboarding away looking out over a beautiful scene out my south window of a field of prairie grass in the foreground...with the hills on the opposite side of the Illinois River on the horizon.

Out my west office window is a large golf course pond teeming with wildlife...with the fairway and green of the beautiful seventh hole just beyond. In my travels out onto the course this winter...I noticed quite a few flaws...but also quite a bit of the simple beauty of a golf course in the wintertime. We take advantage of the opportunity to go out onto the course for a three hour visit whenever snow leaves us and the temperature is tolerable.

In the shop through the door behind me...I can hear and feel the guys working away on equipment in a clean, warm, well lit area...and write with a feeling of confidence that our equipment, our people, and our golf course...will be ready for spring. Lots of seasonal employees are stopping in...wondering when they can get back out here and begin working...and golfing.

It seems that the time for fantasizing...for idle daydreaming...and for being indoors...is just about at an end. March and April are the months when spring finally arrives. That wonderful reality every year...that feeling of everything coming back to life...more than replaces the fantasies of the winter months just endured and finally completed. I think that it is time to shake the wintertime fantasies out of my head and get back out onto the course. Springtime realities await...

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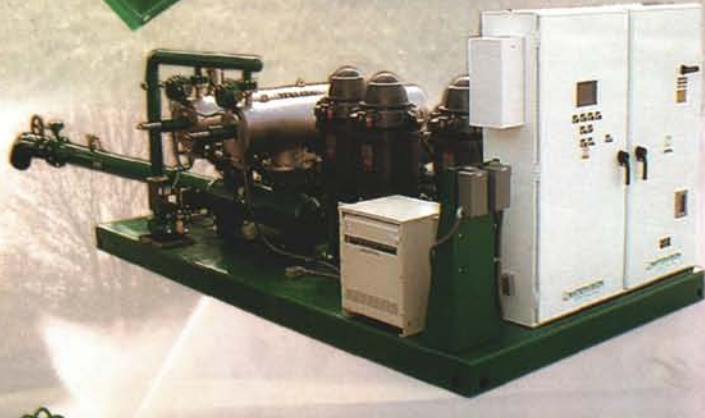

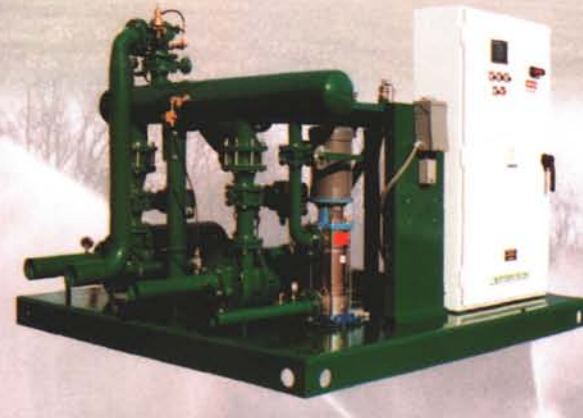

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