



TWO BOOKS YOU'LL WANT TO OWN

By Monroe S. Miller

Two new books of value and interest to golf course superintendents (and lots of others, too) made it to the marketplace in early 1995. *Diseases of Turfgrasses* (Third Edition) by Dr. Houston B. Couch (Krieger Publishing Company; Malabar, Florida. 1995) and *The Spirit of St. Andrews* by Dr. Alister Mackenzie (Sleeping Bear Press; Chelsea, Michigan. 1995) are as different as night and day, but both will have enormous appeal all across our business. Let me say at the outset that both have my highest recommendation.

I have said it myself and have heard untold others also say "that book was so good that I couldn't put it down until I had read every page." Well, that is nearly the literal truth with this truly wonderful volume written by the world famous golf course architect (Augusta National, Crystal Downs and Cypress Point, to name a few) — Dr. Alister Mackenzie. *The Spirit of St. Andrews* is simply a great book.

Do not purchase this book if you think it is strictly focused on golf course architecture. There is lots of that, of course. But Dr. Mackenzie covers every topic related to golf, as well as some that are not. It is page after enjoyable page of good humor, common sense and sage advice for any reader, but especially for people who love golf. His commentary is blunt and pretty near the mark most of the time. That is remarkable, given that it was written in 1933. It is also a remarkable and valuable period piece that will add to the richness of golf history.

This is a "lost manuscript" that has been hidden for sixty-two years. The son of Mackenzie's stepson found it in family papers tucked away in a trunk for all these years. The GCSAA played a role in getting the book published — but I have no details on that role. Our association logo is on the front of the book's jacket.

The book has some great old photographs you will enjoy. And it is organized such that you can pick it up and read awhile, put it down and come

back to it at a later time without losing your place or having to go back to reread.

The story telling and commentary give you the feeling that you have been carrying on a conversation with the author. This style has a lot to do with the appeal of the book.

Golf course superintendents will love chapter 5 (*Greenkeeping*), the section on trees, his 13 principles of an ideal course, and his comments on slow play (he was appalled that it was taking three hours to play an 18-hole round in the days when he wrote this!). It is impossible to note all you will enjoy and the innumerable parts you will be able to relate to directly. So you will have to read it for yourself!

I predict this book will be a best-seller in the world of golf literature. This advice from me is foolproof — get this book into your library. It could be your favorite, too.

The third edition of Dr. Couch's book *Diseases of Turfgrasses* is an enormous work. His books sort of mark the long and productive career of this world recognized grass disease scientist and expert. The original edition came out in 1962; many young Wisconsin golf course superintendents weren't even born yet, and even I was only a sophomore in high school! The second edition was printed in 1973, the first year I was a golf course superintendent, and the latest is now ours in 1995. Few will be able to lay claim to the prominence and presence Dr. Couch has had for so long.

Randy Witt and I waited in line together in San Francisco to get Dr. Couch's autograph in our books. What a pleasant experience! He was fun to talk with, he personalized each book and engaged us in some genuine and sincere conversation. I had taken my second edition book with me and he signed it, too.

But enough of the sentimental. The fact is that this book is a must for a superintendent's library. It is a thorough and complete record of all the

diseases we deal with in our business of growing golf turfs. Although it has the format and heft of a textbook, I found the style of writing very readable, indicating I will probably make use of it as more than just a reference book.

So detailed is the work in this edition that some chapters are, or seem, as long as the entire previous edition. Maybe that is just an indication of the growth of the field of turfgrass pathology.

The color plates of the diseases are the best I have seen and look as though they could be real helpful as a diagnostic aid.

It is an entirely different book from Dr. Joe Vargas' *Management of Turfgrass Diseases* (second edition). As the titles may indicate, the Vargas book offers plans, programs, rate recommendations and all kinds of advice in the control of diseases. Dr. Couch's book, on the other hand, offers no recommendations on specific rates of specific fungicides for specific diseases, instead offering materials and strategies that have shown results. Details are for you to find out from, I would guess, labels and other books and colleagues and land grant university extension plant pathologists. I do not feel that is a shortcoming of the book, however.

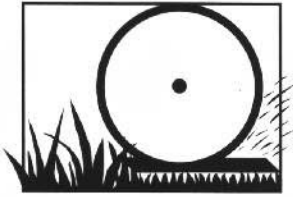
The paper quality, the font selection, the photographs, all graphics and artwork, and the page size are the best. This book exudes quality. Although it is expensive, the book is still a bargain and a resource we all should have. It also gets my highest recommendation.▼

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A Mixing, Loading and Storage Facility With The Environment in Mind

By Randy Smith

This article is about the new Environmental Facility we have built at the Nakoma Golf Club. Our objective was to create an affordable building which would improve upon the safe handling and use of plant nutrients and protectants. I firmly believe we have succeeded in doing that.

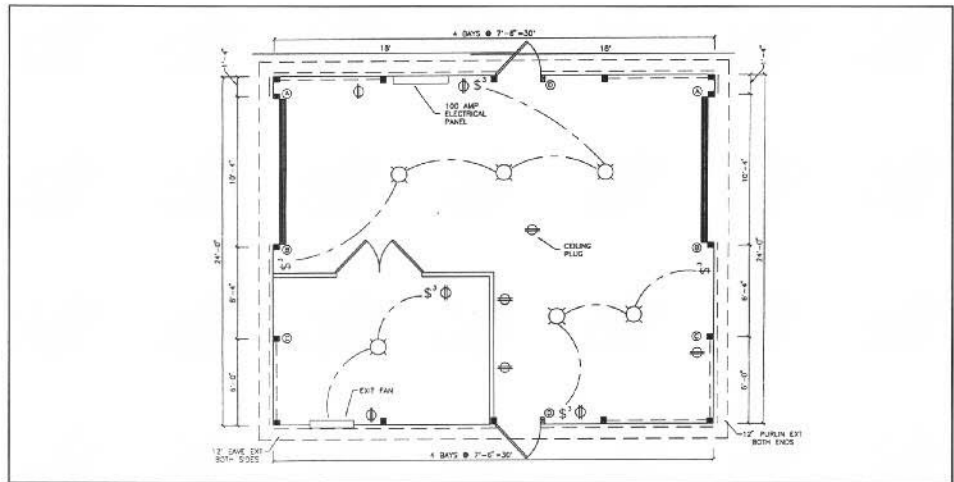
Several things in the past led to the construction of our new facility. I have always disliked the old methods of just filling sprayers on hard surfaces or on open ground with no chance for containment or recycling. The storage of various chemical products in the open, in the shop or next to employees and open drains seemed hazardous and unacceptable.

My long range plan included improvements along these lines, but progress really started when my green liaison and eventual club president asked the question in 1991, "what are your concerns about our golf course maintenance operation?" He didn't expect the number of pages of concerns I presented to him. He had the patience and interest to learn more about our operation which of course made the next step of the presentation a little easier.

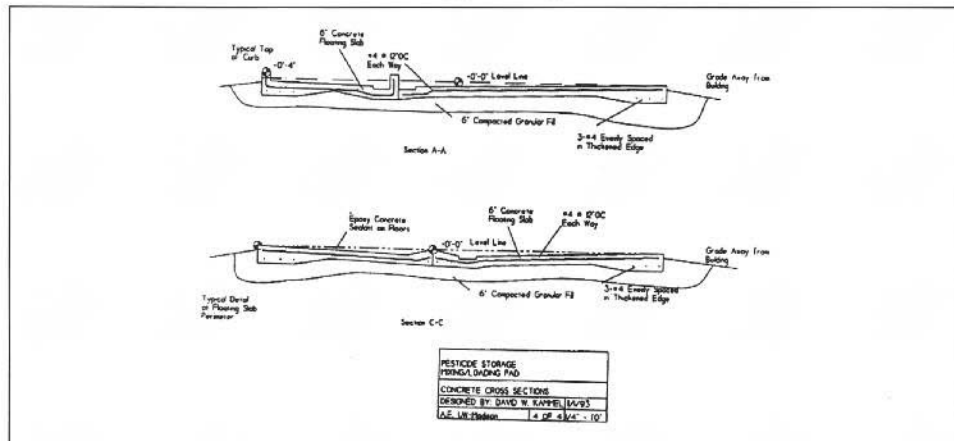
Our first attempt to improve the storage, mixing and loading site was a containment pad with a small modular building. It was discussed with the green committee and recommended to the board of directors. It passed and a total of \$15,000 was approved. However, due to a few construction projects on our course, we did not spend the money in 1993. This was already two years after the original question. It therefore was reapproved for 1994 with more funding.

By this time, we had obtained more information and recommendations from the Golf Course Superintendents Association of America through seminars and their reference *Golf Course Maintenance Facilities*. We also attended a very informative seminar at our Wisconsin Golf Course Superintendents Association annual spring meeting where David Kammel, UW-Madison

Nakoma Golf Club Environmental Facility Basic Floor Plan



Concrete Cross Sections for Mixing/Loading Pad



Department of Agricultural Engineering, gave a presentation on mixing, loading and storage of various agricultural chemicals. In addition, we visited numerous larger containment operations that Mindy Hammacker, Natural Resource Extension Agent, put us in contact with.

These various sources of information led us to a decision to construct a building separate from all other buildings and with a heated section large enough to store liquid products. We also planned for a building that would have room for storing application equipment while also serving as the loading containment area.

Incorporating all of these features resulted in a building project planned at \$25,000 and, in fact, we did overrun this budget. More on that. Please refer to the description of the actual expenditure that appears below.

Summary of Expenditures for Nakoma Golf Club's Environmental Facility

December 1994

Description:

Building - 24' X 30' Pole Building	\$11,045
Doors - 2 walk, 2 drive through	1,135
Permits, misc.	444
Electricity	2,400
Heating/Ventilation	1,987

Plumbing	7,000*
Extra siding for interior	1,000
Concrete work	4,200
TOTAL	\$29,211

* Overrun. The plumbing was completed on a time and material basis due to some uncertain design situations for our structure. The labor portion was enormous in my opinion, but I felt we had no alternative due to codes and eventual inspections. All other vendors were under contract.

The final design was a result of a meeting including David Kammel, Mindy Hammacker, Charles Frazier and myself. Refer to the basic floor plan for the result of our planning.

By budget time in the fall of 1993, we had contacted contractors to build our new structure. We acted as the general contractor to coordinate the different firms involved in the project. But before they could begin, we needed the building permit. I went to procure that supposedly simple document called the "permit" and found out I needed a waiver or "Application of Existing Conditional Use" to be signed by our alderperson because of our conservancy status. That meant selling our purpose.

We did. Then it was back for the permit, or so I thought. I was then told we needed a more complete structural design including the exterior views so they would know how it would look. So it was back to the drawing board. One week later I made my third trip in quest of the permit. Then THEY asked "are you going to have any electricity, plumbing and/or heating?"

"Yes," I replied.

That answer led back to the design table to provide them more details on "who, what, when and how much."

Back to the drawing board. After many hours with the electricians, plumbers and heating contractor, I made yet another trip for the permit. In truth, we needed four permits — one for the building and one for each of the utilities. Before construction actually started, we were well into the 1994 golf season. We proceeded as we found the time.

Our staff prepared the site, an area 75 feet away from existing structures to allow for future expansion and 25 feet from our well. Preparation included subsurfaces of fill sand to meet specifications for the three containment areas shown on the floor plans. The next step was installation of our own 24' X 30' pole building by the contractor. After

the building was up, the concrete work was done. We included plenty of reinforcement. The dikes were finished with gentle slopes to allow ease of entry for people, equipment and product. The concrete work was completed with a single pour by the cement contractor.

Once the concrete had cured, our staff applied two coats of a chemical resistant epoxy. The project was static until this fall when we continued work with the construction of the heated room and the addition of steel to the inside walls. We brought potable and nonpotable water sources to the building. A local plumber did the inside work to meet codes. A simple electric heater, ventilation fan and inlet vent were install next. Most recently, our electrician completed the wiring.

As our operating budget permits, our staff will complete the internal walls with steel siding. Eventually we will pave the roads to both ends of the building. Motion lights, additional fire extinguishers, an "office center" and a cellular telephone are planned.

Our new Environmental Facility is a product of planning by Chuck Frazier and myself, and the club's concern for the safety of people, animals and the environment. We are proud to have been able to complete the "almost affordable" facility which should serve as a model for others to improve upon. It is also an educational adventure for students, educators and peers. Chuck and I are always willing to discuss the project with you or give you a tour. Just call first! 🙏

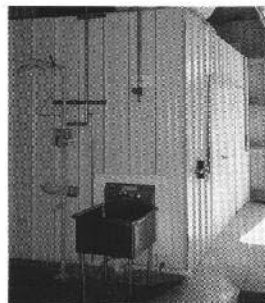
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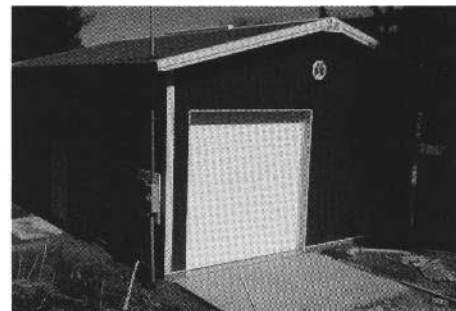
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Kammel, D.W., R.T. Noyes, G.L. Riskowski, and V.L. Hofman. 1991. Designing facilities for pesticide and fertilizer containment. Midwest Plan Service, Iowa State University, Ames, IA.

Kammel, D.W., and R.T. Noyes. 1993. Plans and Specifications for Mixing/Loading Pad and Pesticide Storage Building. P. 52 - 62.



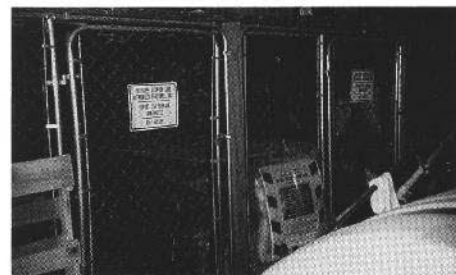
View of outside of Heated Storage Room, including vent and double doors, rinsate tank, eyewash and shower station, s/s sink, sumps and containment dikes.



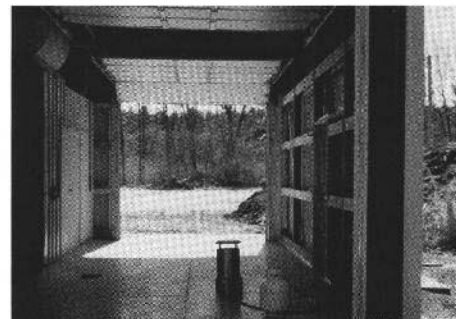
NGC (1995) Environmental Facility for storage/mixing/loading of Plant Nutrients and Protectants.



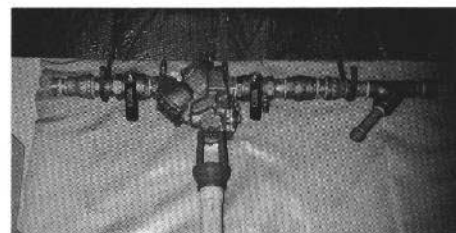
OLD method of storage liquid chemical products.



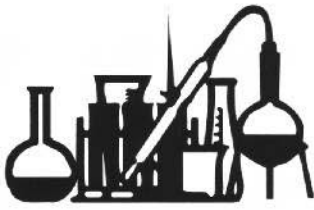
OLD Method of storage in main equipment storage building without containment.



Sprayer Storage area and drive through.



Reduced pressure principle backflow (RPPB) prevention device to be installed as our main fill source from our irrigation system.



Some USGA Putting Green Management Issues

By Dr. Wayne R. Kussow
 Department of Soil Science
 University of Wisconsin-Madison

Putting greens presumably constructed according to USGA recommendations do not always meet expectations. This has happened on even some of the most prestigious courses in the country. Traditionally the blame has been placed on faulty construction. This attitude is starting to change. The feeling is growing that management is a contributing factor, if not the primary reason for some "USGA" putting greens to perform unsatisfactorily.

At the risk of raising the ire of someone (something I seem to have become adept at doing), let me share with you what I see as some "USGA" putting green management issues and where research is urgently needed.

In my opinion, one of the premier issues grows out of how superintendents are responding to club pressures to bring new putting greens into play as quickly as possible. The long term consequences of applying 15 to 30 lb N/M during the grow-in season beg documentation, as do the reasons why superintendents apply this much N in the first place. Is this primarily a response to club pressures or are there actual signs such as turfgrass loss of color that are prompting excessive N rates during grow-in?

Assuming that N application on new putting greens is prompted mainly by poor turfgrass color, then the question arises as to why so much N is needed the first year, only to taper off in a year or two to more typical N rates of 3 to 5 lb/M/season. The most logical explanation one can come up with is that sand-based greens are initially rather sterile environments from the standpoint of microbiological activity. This being the case, there is virtually no biocycling of N. The 20, 30 or even 50 percent of the fertilizer N applied that, in mature greens may be consumed by soil microbes and subsequently slowly released over time, simply whizzes right by the immature turfgrass on new putting greens. This is a research subject that demands immediate attention, first to verify that

high grow-in N rates are a consequence of low levels of microbial activity and, if found true, to seek out root zone additives that are effective in quickly building up microbe populations in putting greens.

It is entirely possible that pushing turfgrass growth too hard during grow-in and then immediately striving for speeds of 10 feet or more when the greens are brought into play is a combination of management objectives that leave us with turf intolerant of low levels of stress of any type. These actions may also negate one of the important features of USGA greens and, in so doing, thrust us into a vicious, downward spiral of declining turf quality.

A fundamental principal designed into USGA putting greens is that water will not move from a finer textured soil into a coarser textured soil until the water content in the finer textured soil approaches saturation at the interface with the coarser textured soil. This is why USGA greens consist of a relatively fine-textured root zone mix over a coarser textured sand layer that, in turn, overlies and even coarser-textured gravel. Through this combination of soil texture differences, the amount of water retained in the root zone mix increases with depth and, at least in theory, gives the turfgrass an adequate reserve of water so as to not suffer moisture stress even on days of exceptionally high transpiration rates.

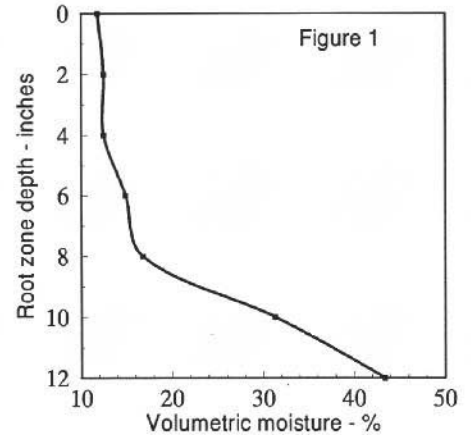


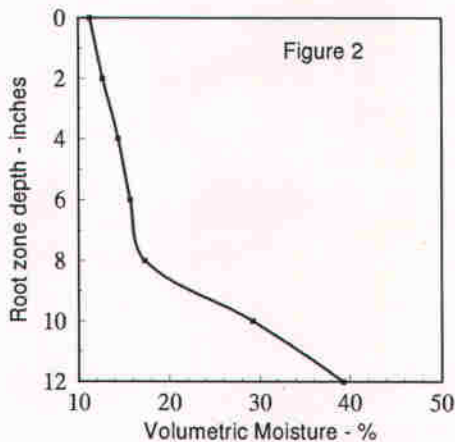
Figure 1 shows the effect of soil texture changes on the amount of water retained in one of our experimental putting greens whose root zone mix was blended from sand and peat that exceed USGA standards. Note carefully the depth at which you first see some increase in water retention (at about 6 inches) and where the effect of a textural change really impacts on the amount of water in the root zone mix (at about 8 inches).

Now let's go back to application of 15 to 30 lb N/M during grow-in and, after grow-in, mowing at something in the range of 0.12 inches to get the desired speed on the green. Under these conditions, is it possible to maintain, let alone ever achieve a turfgrass rooting depth of 6 to 8 inches? I strongly suspect not, and by failing to do so, we lose one of the advantages of USGA greens.

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A possible consequence of not getting the depth of rooting required to tap into the moisture reserve of USGA-design greens is compensatory excessive irrigation. This sets up the green for surface algae growth accompanied by an active cyanobacteria (N-fixing) population, a crowding out of the turfgrass, and blacklayer formation.

We badly need research that shows whether or not the picture painted above is correct and what can be done to avoid these sequential events from occurring. Is it primarily a matter of educating people on what is agronomically feasible or, failing this, redesigning our putting greens to close the gap between whatever depth of rooting can be maintained while meeting golfer demands and the depth in the root zone where the amount of water retained increases significantly?



Instead of modifying the depth of the root zone mix, what if we used an organic amendment that does not meet USGA recommendations? In other words, what if we used a peat that had more than 15% ash content? We've done this in our research. The

moisture profile of the green is as shown in figure 2. From all appearances, turfgrass rooting down to as little as 4 inches is all that is needed to tap into the increase in moisture retention that is a consequence of the way USGA greens are constructed.

Is it possible that a change in USGA recommendations for the amendment used in putting green construction can result in greens whose moisture retention profiles are more in line with the types of cultural practices superintendents are being pressured into using?

Some detailed nutrient management studies may also generate information that can help superintendents achieve what everyone expects from USGA putting greens. The practice of blending into the root zone mix or surface applying a micronutrient package needs inquiry. We've obtained some evidence that, depending on the amendment employed, phytotoxicities of certain nutrients can at least slow grow-in and turfgrass response to the micronutrients is either nihil or limited to sulfur. Tissue analyses continue to raise questions about the need to periodically apply boron to sand putting greens, particularly those with high pH.

Use of calcareous sand creates two problems. One is difficulty in maintaining adequate levels of available phosphorus early in the life of the greens. Carbonates are capable of adsorbing and rendering unavailable large quantities of phosphate. The other problem arising with use of calcareous sand is a soil test method issue. Except in regions of the U.S. where soils are typically calcareous, the soil test methods employed are designed for use on acid soils. They do not work well with calcareous soils.

The general tendency is for these methods to seriously underestimate plant available supplies of phosphorus in the root zone. Management based on such test results could be creating some of the problems we're seeing with USGA greens.

Finally, we have the issue of potassium management in sand putting greens. There is a theoretical basis for the common recommendation that N and K be applied at a 1:1 ratio. Our field and laboratory observations say that this ratio is considerably above where it need be for adequate potassium nutrition. A N:K ratio of 3:2 appears to be more than adequate and even at this ratio soil solution levels of potassium remain extremely high, the result being excessive potassium leaching losses. While this may not seem to be of any great consequence, we always have to remember that when cations such as potassium ions leach, they're accompanied by equivalent amounts of anions. Among these in calcareous soils is the borate ion, which may be why we're seeing declining levels of boron in bentgrass clippings as the season progresses.

Most of the ideas I've presented here are of a speculative nature with very little hard evidence to back them up. Thanks to the financial support of the O.J. Noer Turfgrass Research Foundation, during the forthcoming season we'll be examining in greater depth the influences of root zone amendments on the nutrient dynamics of putting greens. This is but a small part of what I envision as the total need for studies on the effective management of USGA putting greens and possible modification of construction methods, perhaps to the point of regionalizing the recommendations. 🌱

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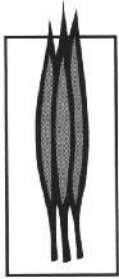
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Updates and Thank Yous

By Tom Schwab, Manager
O.J. Noer Turfgrass Research and Education Facility

On this snowy first day of spring, I'm jotting down some notes on how the Noer Facility season is shaping up. This snow is a welcome reprieve to those of us that still have indoor work to do, like writing GRASS ROOTS articles. The cool, wet weather is conducive to more snow mold damage on our plots. We have enough fungi damage to keep Dr. Meyer, Catherine Smejkal and Steve Millett happy all spring. Some plots were not treated and there is evidence of some distinct genetic resistance among cultivars. The snow mold severity will be evaluated with regard to cultivars, timing of fall fertilization, fungicide variables, and surface covers. This will be reported in the WTA/UW Turf Research Report. The report is one of the benefits you receive by becoming a member of the Wisconsin Turfgrass Association.

In addition to analyzing our own snow mold data, the Noer is compiling a data base on how your (Wisconsin superintendents) snow mold applications worked this past winter. I hope you received a questionnaire early in April and returned it. The questionnaire was sent out to all Class A WGCSA superintendents. We'll make a report in the September/October GRASS ROOTS summarizing the practices and successes of your 1994/1995 applications. Thank you for helping the Noer put together this important snow mold data. If you didn't send back your questionnaire, please do it soon.

There have been reports about the Facility growing by 20 acres. The word from campus is it's not going to happen this summer. We really need this land soon though. The WTA board, UW Turf Team, and others are not giving up. We need to expand our Summer Field Day and our scope of research. Dr. Kussow has been asked to do a new putting

green study for the USGA. A prairie study was just installed last fall. I'll be installing an ornamental grass demonstration this spring. The professors will also be initiating a study on so-called "snake oils" as thatch decomposers. Dr. Rossi is going to be installing a new Kentucky bluegrass cultivar evaluation study in the fall. Industry and the public keep putting more demands on the Facility. I hope the new land soon becomes available to meet these needs.

We're all glad the Turf Team is intact this year. Dr. Rossi was almost hired away by the GCSAA to head up their educational program. He is so enthusiastic when it comes to turf management in Wisconsin that we're glad he decided to stay. He's staying, thanks to your great showing of support for how much we need him in the state. Unfortunately though, Dr. Koval is retiring. He is easing into retirement by cutting his schedule down to 20%. With that 20% he will spend more time at the Noer Facility this summer, so the team will remain intact for the time being. I hope the University will find as great an individual to replace him when he completely retires.

The Noer Facility has just joined the Audubon Cooperative Sanctuary Program (ACSP). The Audubon Society of New York coordinates the program and helps landscape managers develop more ecologically sound greenspaces. Audubon helps by giving tips on conserving resources, creating wildlife habitat, and using plant material

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in more natural communities. There are four different Audubon Cooperative Sanctuary programs, with one tailored to your individual situation. There is a program for golf courses, schools, individual backyards, and at Noer we joined the one for corporate and business properties. The UW Natural Resource Department paid for the registration and they'll be helping us with some strategies. If any of you have advice for our Audubon program or would like to help, let us know. We could also use some extra bird houses if you have some laying around.

I just had the opportunity to participate in the Northern Great Lakes Golf Course Superintendents Association's (NGLGCSA) annual turf symposium. NGLGCSA president Dan Barrett & Co. have a great thing going up there. They dedicated a whole day to topics on landscaping around the golf course. They invited a couple of nursery people, one of whom was growing good size Bur Oak and other hard to find hardwoods for sale. Mark Grundman, Medalist America, gave an excellent talk on establishing prairies. I participated in a panel discussion, along with three NGL superintendents, on landscaping experiences. Watch out Rossi! Those three superintendents were such excellent speakers they may be looking for your job. My personal favorite talks of the day were given by Dr. Lois Berg-Stack from the University of Maine-Orono, Plant and Soil Science Department. This Wisconsin native really knew her plant material! She talked about the latest in planting techniques for everything from trees to perennials. She also talked about design, what

materials work well together, and told us about some of her favorite plants. I hope she starts writing for the GRASS ROOTS again soon! This was my first trip to the symposium but it won't be my last.

Summer Field Day is just around the corner. Mark your calendar for Tuesday, August 15, 1995. The planning committee is working on details as we speak. Exhibitors will receive their registration details early in June and attendees later in June. The research data will be the best ever collected from the Noer Facility because the plots are becoming more mature and data can better be compared with previous year's results.

The facility is ready to take on the new season because of the generosity of numerous individuals and companies. I'd like to personally thank John Deere Horicon Works, Reinders, Wisconsin Turf, Hanleys, and Tiziani Golf Cars for lending us equipment. Numerous golf course superintendents have helped with equipment servicing. Technical support is coming from Reinders Irrigation, Bruce Co., and the UW-Madison. Also I'd like to thank the innovative rebate program donors that donate part of those proceeds to turf research in Wisconsin. And more than that I'd like to thank the superintendents who participate in those programs. With this support of industry and individuals, our turf program will continue to be one of the best in the country. Now, if only this snow would melt! 🍷

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Compiled by Larry Lennert

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