Sand-Based Rootzones--

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tained almost 20% less macropores, or air-filled pores, than either medium or coarse sand. Although fine sand had less air-filled pores, it had much higher > 20% capillary water retention, measured at a -40cm tension.

Capillary water retention is a very important property of a rootzone mixture because it represents free water that remains after gravitational drainage stops. Thus, most of this water functions as water that may be used for plant growth. As a benchmark, most successful sand-based rootzones contain = 15% water by volume (Bingaman and Kohnke, 1970). In addition to capillary water, another important property of a rootzone mixture is the available water-holding capacity.

For these experimental rootzone mixtures, available water was defined as the difference between water retained at a -40cm and a -500cm tension. The -500cm tension was selected as the theoretical "permanent wilting point' because under most normal putting green irrigation cycles a rootzone would rarely be allowed to exceed this value before resupplying water. For comparison, many soil scientists commonly calculate available water for field crop soils as water retained between a -333cm and a -15,000cm tension. The difference between putting green soils and field crop soils is that under natural field systems the soils often possess more silt and clay, are much deeper, and often contain a much deeper rooted unmowed crop. Thus, the -500cm value seems more appropriate for our shallow, coarse-textured putting green rootzone system.

With that in mind, fine sand retained significantly more water at all soil water tensions than any sand, and most importantly, had 10 times the available water than either medium or coarse sand alone. Further, the medium and coarse sand had capillary water retention less than 6% and a correspondingly very low available water status. If these sands were to be considered for constructing a sand-based putting green rootzone, they would certainly need to be amended.

Comparing the amendments by themselves to the sands showed that the amendments had significantly greater total porosity than any of the sands. Total porosity for each rootzone component ranked in the order: peat moss = Profile = Isolite > Ecolite = Greenschoice > fine = medium = coarse sand. Peat moss, Profile, and Isolite had greater than 70% total porosity, compared to the sands, which had 40-45%. Both peat moss and the inorganic amendments had 10% to 28% greater total porosity than the most porous sand, fine sand.

These data illustrate that in order to have such high total porosities, the inorganic amendments must possess a relatively large internal pore space. These internal pores probably account for much of their water-holding capacity. The percent air-filled pores were generally similar, > 30%, for all amendments and the medium and coarse sand. The corresponding percent capillary pores were highest for the inorganic amendments Profile and Isolite, > 35%, and lowest in Greenschoice and Ecolite, with < 25%, but still greater than any sand.

Although porosity is an important property for relatively shallow rootzones like putting greens (= 12"), another important property is the amount of water released at a relatively low tension (-20cm tension) and how much water remains at the defined wilting point (-500cm tension). These data provide information regarding overall amendment particle size, pore size architecture, and possible field performance. For example, if an amendment releases most of its water at a relatively low tension and retains little at a moderate tension, it is probably composed of relatively coarse-textured particles and may be of little use in an already coarse-textured medium like sand. Conversely, if an amendment releases little water at low tensions and retains significant amounts at high tensions, this amendment is probably composed of many very small pores, a situation that also may be undesirable because the water might not be available to the plant during stress periods.

In these experiments, all sands and amendments except fine sand released 28% to 36% of their water between saturation and -20cm. Water released at this low tension is associated with gravitational drainage and generally would not be retained in rootzones exceeding 8" depth. In contrast to these rapidly draining sands and amendments, fine sand released only 0.4% of its water at this low tension. Thus, the fine sand retains a rather substantial amount of water, which may be useful as rootzone depth increases.

To further characterize the moisture release properties of the amendments and three sands, water retention data were collected for a range of increasing soil water tensions. Each rootzone component seemed to have a characteristic tension where most of the water was released. This critical tension appeared to be directly related to particle size, with finer textures requiring higher tensions to release water. For example, coarse sand abruptly released most of its water between -10cm and -20cm, medium sand between -10cm and -40cm, and fine sand between -20cm and -100cm.

Compared to the sands, the inorganic amendments and peat contained significantly more water at saturation, > 55%, and released their water more gradually with increasing tensions up to -60cm. Once the bulk of water was released, the water content of the amendments leveled off and remained relatively constant for all four inorganic amendments out to the -15,000cm tension. Peat moss, on the other hand, had the most gradual release of any of the rootzone components at all tensions. This property was attributed to the wide distribution of pore sizes created by the fibrous particles of peat moss. For the sand/amendment mixtures, the water release curves were generally similar to the curves for each sand. The only difference was that amended sands retained slightly more water than unamended sands at each tension .

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MGCSA Scholarship Winners Announced

Two MGCSA Legacy Scholarships and two Joseph S. Garske Legacy Awards have been announced.

Recipients of the MGCSA awards, both for $1,000, this year are:

Zach Erickson, Austin, a civil engineering student at Iowa State University and (son) of Leif Erickson, Simplot Partners;

Paul Fischer, Brooklyn Park, a pre-dental student at the University of Minnesota/Duluth and (son) of Tom Fischer, CGCS, Edinburgh USA;

Receiving the two Garske awards, named after Joseph S. Garske, found of Par Aide Products Co., are:

Aaron R. Smith, Palm Desert, Calif, son of Mark and Elsa Rosales Smith and a student of Biblical and Theological Studies as well as Spanish at Bethel College in St. Paul, who received the renewal of his $1,250 grant;

Jonah Evenson, Pelican Rapids, (son) of Brian Evenson, Birchwood Golf Course, and a student of accounting, math and finance at Gustavus Adolphus College in St. Peter.

MGCSA AWARDS

A student at Rochester (Minn.) Community and Technical College and two at Penn State University have-been named the winners of three Harold Stodola $1,000 Scholarships for the 2000-2001 school year.

They are:

Thomas E. Edstrom, Pine Island, Minn., a student of horticulture technology with a focus on lanscape, golf course and ground maintenance at Rochester Community and Technical College, Rochester, Minn.;

Joseph Maloney, Chanhassen, Minn., a turgrass major in a two-year program at Penn State;

Eric K. Ritter, Burnsville, Minn., a turfgrass major in the four-year program at Penn State.

Thomas Edstrom, a 1995 graduate of Pine Island High School, also studied at the University of Minnesota-Duluth before beginning his agronomic studies at Rochester, where he wanted " better educate myself scholastically and technically in turf management."

At Pine Island he participated on the Student Council, Math League, All-School Playk, AFS, German Club, football, basketball and baseball.

An Eagle Scout, he also has been a volunteer reader for first grade students and is a student chapter member of the GCSAA. He also has worked on the St. Charles and Zumbrota courses.

Joseph Maloney was graduated from Minneapolis Southwest High School in 1980, then completed two years at Anoka-Hennepin Technical College before going to Penn State.

Recipient of an Outstanding Achievement Award in Industrial Arts in 1980, he was on the President's HonorRoll with a 4.0 GPA for all six quarters at Anoka, was one of 36 students in the United States selected to attend the Jacobsen Future Turf Managers Seminar in Racine, Wis. in195 and earned another 4.0 and a 3.95 GPA at Penn State. He also has passed a series of eight tests to become an ASE certified Master Automotive Technician and is an active member of the Penn State Turf Club.

Joseph has worked at Hazeltine and The Wilds.

Eric Ritter, a 1998 graduate of Cretin Durham Hall in St. Paul, expects to be graduated from Penn State in May, 2002.

Named to the Dean's List in high school, he has played considerable hockey, competed in many bass fishing touornaments and has served on the Student Advisor Board for Penn State's intramural hockey league.

He won the McKeesport Academic Scholarship at Penn State and an MGCSA Scholarship in 1999.

He also has worked during the summer in golf course maintenance since 1997 at Brackett's Crossing in Lakeville and at Penn State golf courses.

Sand-Based Rootzones--

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Water retained at theoretical wilt (-500cm) was greatest for the amendments, ranging 20% to 34% by volume, and least in unamended sands, 0.6% to 3%. Of all the rootzone components, available water was highest for the fine sand, 24%, whereas the other sands had less than 3% available water. This suggests that particle size and the architecture of adjacent particles when in contact, not a high degree of internal pore space, may be a more important determinant for available water.

Substantial data were generated on how the amendments responded in each different sized sand. However, for the sake of brevity, a general summary of the sand/amendment responses follows. Overall, amendments when mixed with the three sands had the most predictable response on porosity and water retention in the coarse sand and the least in fine sand. Fine sand and amended fine sand mixtures were the only rootzone mixtures that consistently met USGA guidelines for pore size distributions, 15% to 30% and 15% to 25% for air-filled porosity and capillary water retention, respectively (USGA, 1993).

The medium and coarse sand classes failed to meet specifications because they contained an excessive volume of air-filled pores, which would promote droughty conditions. The only exception was medium sand mixed with 20% peat, which also met guidelines. Although fine sand mixtures generally met specifications, not all fine sand mixtures met guidelines. Mixtures that failed were 10% and 20% peat or 20% Isolite and Profile amended sands. These mixtures were unsuitable because they retained too much water. Rootzones constructed with these mixtures may be undesirable because of excess soil wetness. This condition would probably contribute to poor turfgrass rooting, inadequate soil gas exchange, and problems with ball marking, footprinting, etc.

Bulk Density: As expected, amendment additions decreased bulk density for all three sand sizes, with peat-amended sands resulting in the lowest bulk density of all amendment mixtures. This result was anticipated because peat has the lowest particle density of the rootzone components. It is important to remember, though, that bulk density values alone generally are not an indicator of a successful rootzone mixture.

Percolation Rate: Saturated hydraulic conductivity, or percolation rates, were very high for all three sand sizes, > 35" per hour, and ranked in the following order: coarse > medium > fine sand. All sand mixtures had percolation rates that were much higher than the recommended 6" to 12" per hour, probably due to the highly uniform sands used. This observation is not unusual when working with very uniform sands (Bingaman and Kohnke, 1970).

Amendments generally decreased the percolation rate of the sands, but considerable variation occurred. The average percolation rates for each amendment across all three sand classes ranked in the following order: Greenschoice = Ecolite = unamended sand = Isolite = Profile > peat moss. As expected, the 20% amendment rate significantly decreased percolation rates more than the 10% rate. It is important to note that no amendment or incorporation rate resulted in percolation rates falling below USGA guidelines.

Nitrogen Leaching

Ammonium: Amendment additions significantly affected nitrogen leaching, most noticeably due to a wide range in ammonium (NH4+-N) leaching. Nitrogen appeared rapidly in the effluent of all rootzone mixtures, with peak concentrations around 70 ppm occurring near 0.5 pore volumes of leaching water. As expected, significantly higher peak NH4+-N concentrations and more cumulative NH4+-N leached from unamended sand than from 20% (v:v) amended mixtures. Leaching decreased in the order of unamended sand > Greenschoice = Isolite > peat > Profile > Ecolite. The most effective amendments, Profile and Ecolite, decreased NH4+-N leaching by 75% and 88%, respectively, compared to unamended sand. The effectiveness of these amendments for decreasing NH4+-N leaching is directly related to their relatively high CECcompared to the other products.

A second study evaluating incorporation rates for Profile and Ecolite ranging from 1% to 20% by volume demonstrated that the loss of NH4+-N and the peak concentrations decreased in a stepwise manner, as incorporation rate increased. The highest rate, 20% by volume, resulted in the least NH4+-N lost for each of these amendments. This response is consistent with the results of MacKown and Tucker (1985), who reported decreasing NH4+-N losses with increasing zeolite percentage in sand mixtures. In the present study, no difference in leaching between Ecolite and Profile were detected except at the 20% rate. At this rate, significantly less NH4+-N leached for the Ecolite-amended sand. Although the 20% amendment rate was most effective, this quantity of product may not be economically practical when blending rootzone materials for green construction.

A third study determined the influence of amendment incorporation depth of 10% Ecolite and Profile, and demonstrated that incorporation depth significantly affected leaching. Even at a relatively shallow incorporation depth of 1", these amendments decreased cumulative NH4+-N losses by almost 25%. Further, like the rate study, increasing the depth of the amendment resulted in a step-wise reduction of NH4+-N leaching: Incorporation throughout the entire 12" deep rootzone resulted in the least NH4+-N leaching.

Nitrate: Although Ecolite and Profile were effective at decreasing NH4+-N leaching, they were without effect on nitrate (NO3--N) leaching. For all rootzone mixtures, more than 90% of the applied nitrate was recovered in the

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leachate. In general, unamended sand and amended sand mixtures in all experiments were similar regarding high NO3--N leaching losses.

Turfgrass Establishment

Creeping bentgrass establishment on these sand rootzone mixtures was relatively slow, requiring > 250 days to reach 100% coverage. This response may have been due to the somewhat droughty nature of this predominately medium-sized sand. This sand size was selected to best evalute the water-holding benefits of the amendments tested. Although establishment was relatively slow, the significant effects and benefits of a rootzone amendment in this sand were obvious. Compared to unamended sand, bentgrass established faster on any of the amended sands. Rootzone mixtures ranked in order of increasing effectiveness were: unamended sand = Greenschoice < Profile = Ecolite < peat moss, with Greenschoice being similar to unamended sand on two rating dates.

The faster establishment of the amended sands is attributed directly to the greater water retention and, to a somewhat lesser degree, the increased nutrient retention compared to unamended sand. Although there was little difference in final establishment between sphagnum peat moss and the inorganic amendments Ecolite and Profile, there is a difference in cost between these materials. In most cases, inorganic amendments cost considerably more than sphagnum peat moss when used at the same incorporate rate (Moore, 1999). This may explain the continued popularity of peat moss for amending sand-based rootzones.

Conclusion

Amending sand with inorganic amendments or peat moss had significant beneficial effects on rootzone mixture physical properties, nitrogen leaching, and creeping bentgrass establishment. Although many of the inorganic amendments hold considerable water, it appears that if water retention and availability are important characteristics for a desirable rootzone mixture, then the most suitable amendment from both a quantitative physical analysis and an economic standpoint is peat moss. This fact is particularly pertinent in coarse-textured sands, where a rather substantial quantity of the amendment would be required to effectively improve the water retention of these sands.

Furthermore, inorganic amendments vary in their ability to limit nitrogen losses. No amendment had a dramatic effect on NO3--N leaching. However, NH4+-N leaching losses can be substantially decreased to 8% or less by various incorporation rates and depths of the clinoptilolite zeolite, Ecolite, and the porous ceramic, Profile, and to a lesser extent, sphagnum peat moss. Again, NO3--N leaching continues to be a concern in sand-based putting green media, particularly during turfgrass establishment when turfgrass root systems are small and when soluble fertilizers are used. However, it may be possible to minimize NO3--N leaching by constructing putting greens from sands amended with peat moss combined with either a zeolite or porous ceramic and using an NH4+-N-based fertilizer program. The peat moss would be beneficial for the water-holding properties and the inorganic amendment would provide nutrient retention. The use of slow-release fertilizer products and the practice of spoon feeding greens during establishment are other proven methods to reduce nutrient leaching.

Lastly, it is important to remember that not all amendments are suitable for every rootzone amendment situation. Each amendment may react differently depending on the particle size range of the base sand used and the quantity of the amendment incorporated. Some sands may hold too much water and others not enough. Therefore, it is extremely important to submit a potential sand and sand/amendment rootzone mixture to an accredited laboratory for physical analysis to determine if it meets specifications. Finally, although most of the amendments seem physically stable enough for modern putting greens, more research needs to be conducted to determine the long-term field performance before they can be widely prescribed.

Insight and Viewpoint ~The 2000 Chapter Delegates Meeting

By MICHAEL J. BROWER
Superintendent, Hillcrest Country Club

Throughout the weekend of September 8-10, I had the privilege to represent the Minnesota Golf Course Superintendents' Association members at the 8th Annual GCSAA Chapter Delegates Meeting in Lawrence and Kansas City, Kansas. Delegates from 98 chapters were represented and joined by GCSAA Directors, Officers, 2001 Candidates, Committee Members and Staff Members. From early Friday morning to midday on Sunday we met and discussed over a dozen important topics and programs, including the Professional Development Initiative.

I was very impressed by the strong leadership of both the GCSAA Directors and Officers, and the GCSAA Staff. The meeting was well organized, the hospitality they showed to the delegates was excellent, and their great dedication to the profession and the membership was very obvious. The delegates questions, concerns and comments were welcomed throughout the meeting.

The association headquarters is located in Lawrence, Kansas, about an hour west of Kansas City, and houses 120 staff members. The first day of the meeting was held here and we were given a short tour of the offices following our lunch break. Like many business offices, the GCSAA office is organized into different departments (12 to be exact). We were able to stop at each, meet staff members and ask questions about what they do. The staff was friendly and seemed excited to have all of us golf course superintendents in the building. A very recent addition to the interior is a front entry historical display with mowers, photographs, magazines and more. On the walls throughout the building were displayed photos and drawings pertaining to golf and turf management. It provided a nice identity to what the building is all about -- golf and golf course management. Outside, some improvements were also made to the landscape, which despite the drought in that area, looked very nice. Plans are underway to have a life-size statue of "Old Tom Morris" erected next year at the entrance to the building.

Important Issues Regarding The Professional Development Initiative

Members of the MGCSA and GCSAA have said and continue to say that golf course superintendents want more appreciation and recognition, compensation, retention and job opportunities. The Membership Standards Resource Group (MSRG) was formed by the GCSAA to look at how to achieve these goals. From their work to help members achieve these goals, the Professional Development Initiative (PDI) was born. After introducing the first draft of the initiative two years ago, the MSRG and the leaders of the GCSAA have asked for input from the members. Particularly over the past year, they've done an outstanding job of communicating what PDI was to the membership, and seeking feedback from the membership on how to make it better. They have listened, and the new PDI proposal meets our needs very well. I ask that you read the new proposal carefully so that you can make an informed decision.

The foundation of this project continues to be education, both formal and through continuing education. The classification standards for members are built from this educational foundation and create a new opportunity for members to document what they're doing on the job and in the classroom and use that as a tool to communicate their value to employers. It's no secret that formal education and continuing education are highly valued by employers. This is a positive step to the future, and as the PDI mission statement says, "To improve the knowledge, skills and abilities of the professional superintendent that contribute toward improved playing conditions and the enjoyment of the game of golf."

What are the significant changes to PDI following membership input? The policy change that allows continuing education credit for local educational events that are equal to GCSAA offerings. An alternative path that allows all superintendents to reach Class A regardless of formal educational level achieved. The conversion of the HR Web from mandatory for Class A to a resource tool with service points awarded for its use. The requirement that all Class A members have a pesticide license or pass the equivalent GCSAA administered test.

Will this benefit superintendents or just GCSAA's bottom line? Individual superintendents will always benefit from continuing education. The continuing education requirements are linked to participation in your local chapter, your community and your golf course.

Why is a pesticide license or equivalent testing required? It is critical to the image of the profession that each superintendent and the GCSAA can be in a position to demonstrate that our Class A members are trained in the safe use of pesticides. Our image as environmental stewards is a public expectation.

Is the proposal too weak to attain the goals set forth? The changes made have resulted in a program that is attainable, accessible, and affordable and reflects the desires of the membership. Membership input has strengthened the final proposal.

Will there be a dues increase associated with the proposal? No dues increase is associated with the proposal.

What impact will this have on our local chapter? Chapters can expect to see more attendance at local chapter meetings, more interest in local educational offerings and more willingness to serve on boards and committees.

Each GCSAA member was recently mailed the final proposal of the PDI. It's important that you review this information. If you have not received your copy of PDI, you can request one from GCSAA member services at 1-800-472-7878. Or, you can access the PDI proposal on the GCSAA website at www.gcsaa.org. Also, you may call me with any questions or comments you have about PDI at 651-777-5186.

Association Financial Update and Fundraising: Three companies actually exist under the GCSAA name. They are GCSAA, a 501(c)(6) tax exempt professional society, GCSAA Communications, a for profit taxable subsidiary, and the GCSAA Foundation, which is a 501(c)(3) tax exempt charitable organization. The GCSAA and GCSAA Communications combined financial results ending June 30, 2000 were Total Revenue--$19,539,000, Net Income--$204,000. The GCSAA Foundation raises funds through member dues, the Golden and Platinum Tee Club, along with individual and corporate donors. These funds are then applied to research, grants, scholarships, advanced education and historical preservation. The foundation provided block grants as follows in fiscal year 2000-01, Education--$200,000, Research--$328,000, Scholarships--$115,000, and Historical Preservation--$368,000. "Investing in the Beauty of Golf" was created in February 1998 as an endowment to fund applied research and educational initiatives. The original campaign goal was $3.5 million, revised to $5 million in August, 1999, and the current status of funds raised is $4.5 million.

National Public Relations: GCSAA's public relations goal is "to showcase the extraordinary virtues of the golf course superintendent and the impact you have on golfer's performance and employer's profitability." Tools being used are image posters, press releases, website, print advertising, video public service announcements, professional golf tour media agreements, tourna

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ment fact sheets, *NewsWeekly*, and *Golf Course Management* magazine.

Conference and Show: Over 23,000 attendees were at the 2000 Conference and Show in New Orleans. 750 exhibitors displayed their goods over 275,000 square feet of trade show floor. Over 8,000 people participated in the conference educational offerings. This year's educational seminars have grown to an all-time high of 120 seminars, of which 19 are new. GCSAA is offering for the first time, a "super saver" travel/accommodations package for the 2001 conference to encourage additional attendance.

Research Programs: The goal of the GCSAA research programs is to provide usable information for its members. One focus has been on applied projects which test cultural techniques and management strategies, and product testing. Results are generated quickly as opposed to long-range research projects that may have a basic science orientation. Another focus is on-site testing on golf courses. There are three GCSAA Research Funding Programs that utilize those approaches, the National Research Program, Chapter Cooperative Research Program and the Industry Partners Research Program. The National Research Program is designed to address issues of broad, national scope and currently include the *Golf Course Water Quality Study, On-Site Putting Green Trials,* and *On-Site Fairway Overseeding Trials.* In addition, the National Research Program is designed to address locally relevant problems and partners local chapters, universities and GCSAA. There are currently 21 of these studies being conducted across America. The Industry Partners Research Program is designed to conduct side-by-side comparisons of products marketed to the golf course industry. This program is co-funded by the USGA and is in its inaugural year. The first category of products to be tested are wetting agents.

GCSAA Education: The mission of GCSAA education is to be "the main contributor to the professionalism and competency of golf course management." To enhance the quality and consistency of its educational seminars, GCSAA has formed a Faculty Resource Group and Faculty Newsletter, and has established a formal faculty development process that begins in October, 2000. In addition, the GCSAA staff and faculty are busy developing alternative educational delivery mechanisms such as webcasting, online learning experience, action learning, paper-based self-study programs and video conferences. These learning opportunities are being designed to be interactive, accessible, learner-centered, competency based, global in scope, and culturally responsive.

GCSAA Environmental Initiative: The mission of GCSAA is "to ensure the environmental integrity of golf and golf courses by supporting the continuing development of sound environmental principles in its members and enhancing their image as environmental stewards. "The areas of focus are the GCSAA educational seminars, Audubon International, Center for Resource Management and partnerships with allied associations, environmental groups, government agencies and industry.

GCSAA Legislative Conference in Washington, D.C.: Plans are underway for the First Annual GCSAA Legislative Conference in Washington D.C. in September 2001. Representatives of GCSAA and affiliated chapters will meet in Washington to address pertinent issues to the industry. We will be hearing more about the details in the upcoming months.

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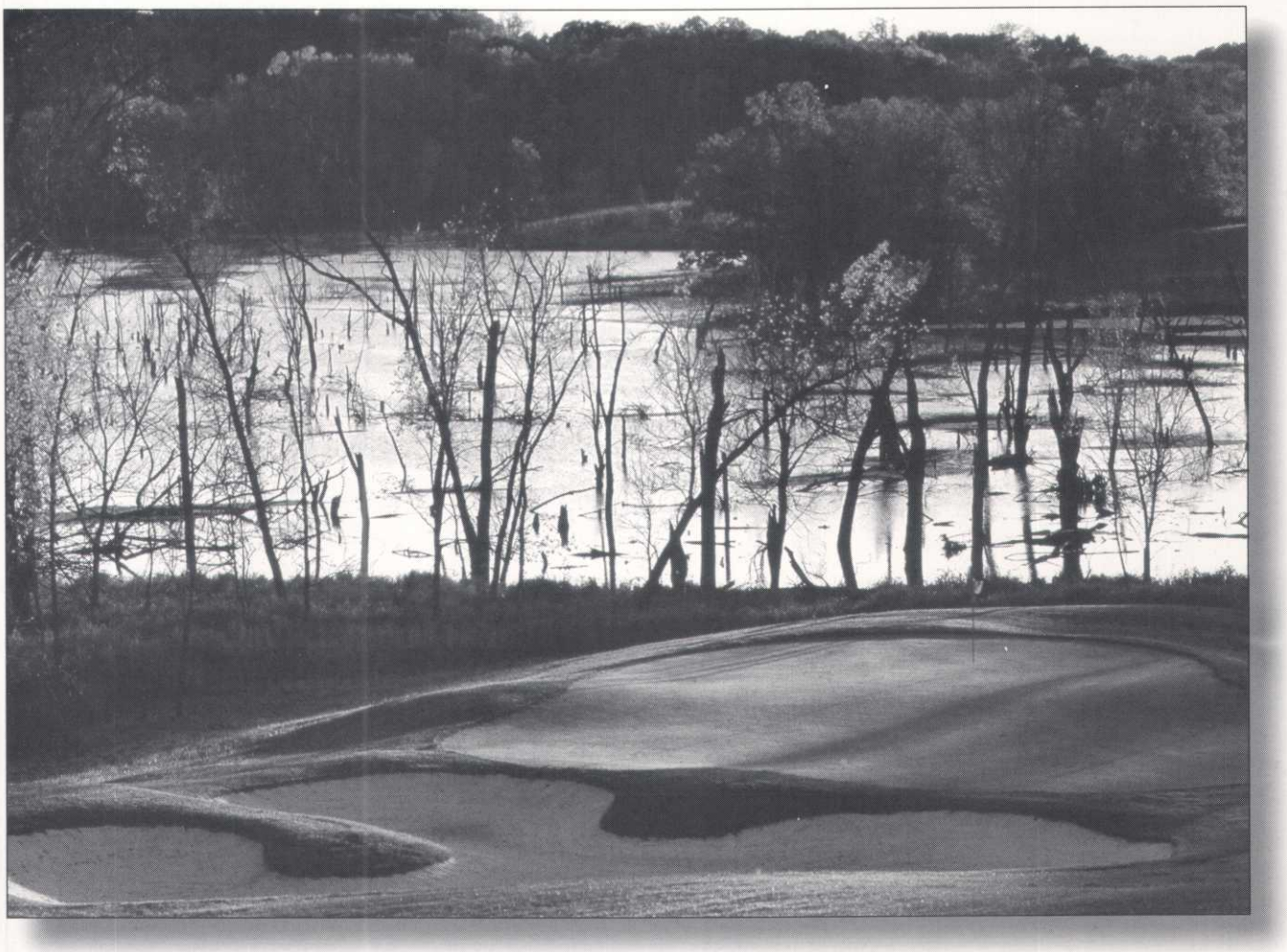

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Editor's Corner

By Steve Shumansky
Perham Lakeside Country Club

THE SEASON IS.....

Well, it's October. I hope I'm safe saying it's over, for the most part!! We all had an early spring, and it has been a long year, and I'd rather say we had closed on or about a normal time, not something like November or even December. Am I just a little burned out? Can you say yes? I think so. Everything has been aerified, the leaves are all cleaned up, the grass has basically stopped growing, the irrigation system has been blown out and our fall chemical applications have been made. Does that mean the fat lady is going to sing? I sure hope not, because I've heard a few fat ladies sing..... and maybe they should take up tennis or golf, because they simply can't sing.

NOW IS THE TIME.....

To either wrap it up or just wait until spring. Between small game hunting, bow hunting, duck hunting and getting ready for deer hunting, or maybe it's that last splurge to finish another project at the course. Get on it!! Between spraying fairways and trying to pick the "right" day to spray the greens for the last application for the season. Besides, everything else that is going on, such as splitting wood for the winter, and with today's fuel prices, it makes it not seem quite as much work as usual. Pulling the dock in from the lake place, or planning that winter project at home for the winter. Scheduling is the key, we do it all year, and when it comes to us doing our own personal things, sometimes we plan too far in advance, or just think we have it all covered. So..... Whatever your plans..... Get on it!!

CONGRATULATIONS AND BEST WISHES

Go out to Matt and Shelly Mckinnon on their wedding. I was lucky enough to attend their wedding at Cragun's on the 23rd of September, and it was simply just beautiful. Matt, you're a top-notch person as well as a top-notch superintendent, and I think you will also be a top notch husband. I wish you both the very best out of life!!

With that I'll close, I hope you are all as happy it's going to get cold as I am.... See ya next month.

--Steve Shumansky
Editor

Ready For Winter Yet?

Applying your snow mold chemicals can be a rather ceremonious event. Especially after a season full of challenges.

It's your final rite of passage as you wrap up another season and enter a less stressful time of year. Kinda like shutting off the lights before leaving town.

North Star Turf would like to help you celebrate this event by providing you with the area's broadest selection of snow mold fungicides at very competitive prices. Products like Chipco 26GT, Echo 720 chlorothalonil with Echo Stick, Penstar PCNB, Teremec SP and Chloroneb 7.5G will provide the arsenal you'll need to go to war against pink and gray snow mold this winter.

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