



GCSAA AFFILIATE

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The newsletter from the Northern Michigan Turf Managers Association

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RECYCLED PAPER

President's Message

With the final days of the year approaching, it is a good time to reflect back on the past year. There are two major areas that certainly deserve your full attention. First of all is your family. With the growing season over, it is a good time to spend some extra hours with your family members. Throughout the growing season, we tend to shorten the amount of time that is shared with our families. Take full advantage of the shorter work hours for the next few months and indulge yourself in some good old family fun. Don't forget that it is your family that gives you that extra support to keep you going when needed.



President Jeffrey Holmes

It can be as simple as a smile from your son or daughter or a caring touch from your wife or husband. Your loved ones are your true friends.

Second is the job. How did it all stack up for 1992? I'm sure you found several days to be productive and rewarding. Now is the time to lay out 1993 and simulate all the programs that worked for the operation in 1992.

Take time now to fine tune the areas of concern that need improvements. One way to help do this is by attending educational seminars that allow you to become more fluent in an area that you are weak in. This is one of the best ways to strengthen your self-worth, to yourself, and to the club, change your so-so running programs into model programs by making the correct updates.

Go to the seminars with the frame of mind that you will learn something. Take the information gained back to your staff and put it to work for you. Knowledge gained today always helps make your job easier tomorrow. If you don't buy that, then let me say that you will know how to do the job correctly. The correct way is not always the easy way, but the job will be done right.

The mind stimulating seminars that will turn you into a wealth of knowledge started in December with the Ohio Turfgrass Conference.

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A few of the seminars to follow are:

- Jan. 5-7 Michigan Turfgrass Conference
- Jan. 7-9 Rainbow Tree Care Seminars
- Jan. 11-13 Mich. Nursery/Landscape Assoc.
- Jan. 23-31 G.C.S.A.A.
- February NMTMA Seminar
- March 9 NMTMA/GAM Seminars
- April NMTMA Seminar

I hope that this schedule will help some of you to plan ahead and be a participant at the seminars. When we don't attend the educational updates, the people that we hurt are ourselves, and possibly the industry. If we do something wrong, it affects the whole group. Please make a point to attend the seminars that will best help you enhance your knowledge.

I hope all of you found the holidays to be enjoyable and relaxing.

Jeffrey Holmes

New Years Resolution: Look Good Golfing

Holiday greetings to everyone. Hopefully the holiday season has gone well for all of you and finds you looking forward to 1993.

Since I have been a member of the NMTMA Board of Directors, one of the board's goals has been to improve the image of the golf course superintendent. We need to remember that our actions and appearance have a direct influence on our personal image and organization. We are the ones



Brian Holmes

that have to make the commitment to improve our organization, because it will be only as good as its members.

One way to help to do this is to support the NMTMA dress code. The dress code is always printed on the bottom

of the Turf Times Newsletter. Represent your organization with class by wearing a sweater or coat and tie to all dinners and meetings. Nice sport clothes are required for all golf outings. Please refrain from wearing jeans, tee-shirts, cut-offs, etc., to golf outings. Your guests, whether they be friends, club members, or even work crew members, are your responsibility. Please remind them of appropriate appearance and conduct.

The saying goes, "Golf is a gentleman's game." Let's remember that by using proper golf etiquette with fairness and good sportsmanship at all golf events. I would urge all who can to use the handicap system offered by their clubs. Handicaps should be a way for all golfers to play on an even level. The NMTMA should be able to show a quality golf game by using all of the rules of golf as they are intended. Let's all be "Gentle persons".

Brian Holmes

The Assistant's Perspective: Communication

by Doug Sarto, Assistant Superintendent, High Pointe Golf Club

Communication is as important to golf course maintenance as location is to real estate, debits and credits to accountants, Ag, CO₂, H₂O to chemists, etc. Although I believe our verbal communication is successful at High Pointe, please bear with me as I communicate in writing the importance of verbal communication.

The first thing I want to emphasize is the communication between the superintendent and the assistant superintendent. Mike and I show up for work at least a half hour before the staff starts, giving us time to discuss the day's agenda. It is vital to know what was accomplished the day before in order to know what needs to be done in the near future, the next month and the next year. After the crew leaves for the day we discuss in more detail our thoughts and observations of the day. Even at days end when I am at home with my loving wife, Mike and I still communicate. If the phone rings in the evening, my wife will say "Hi Mike" before I even answer the phone.

The next level of communication is that between the assistant superintendent, superintendent, and crew. Together, Mike and I approach the crew to discuss what we would like to accomplish that day and why. We let the crew mem-

bers with "general" tasks go to work and talk to the other crew members with special projects on a one to one basis so that they clearly understand what needs to be done. We also answer any questions that the crew may have, as a matter of fact, we encourage it. We do not wish to have anyone performing a job if they don't understand what it is and why they are doing it.

Communication between the clubhouse and the maintenance department is also very important. One example might be aerifying greens on the day the course owner is planning on bringing friends over to play golf. Every outing, tournament, and special event needs to be discussed with the assistant superintendent or superintendent ahead of time so that schedules and plans can be made. I can't stress this enough.

There is much more to this communication thing that I haven't touched upon, but my space is running short. Thanks for reading.

Doug Sarto
Assistant Superintendent
High Pointe Golf Club

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Symposium: Irrigating with Wastewater Can Clean and Conserve Water

Providing practical answers to questions concerning the use of effluent water for turfgrass irrigation and encouraging greater acceptance of wastewater irrigation as a significant means of conserving an important natural resource will be the focus of a Golf Course Wastewater Symposium on March 4-5, 1993.

The symposium, hosted by the United States Golf Association (USGA) in cooperation with the Golf Course Superintendents Association of America (GCSAA), American Society of Golf Course Architects, Golf Course Builders Association of America and the National Golf Foundation, will be held at the Newport Beach Marriott Hotel in Newport Beach, Calif. The Wastewater Symposium will bring together golf course superintendents, turfgrass managers, engineers, agronomists, golf course architects, equipment manufacturers, and professionals from other disciplines who have a role in planning, designing and operating wastewater irrigation systems.

Effluent water from sewage treatment plants and wastewater from other sources have been playing an increasingly important role in golf course irrigation as the use of potable water for irrigation has come under public scrutiny. Studies have shown that turfgrass can act as a filter to remove impurities from wastewater, returning cleaner water to groundwater supplies.

An indexed proceedings with summaries, references and appendices will be published from the symposium. For more information on the event, contact Dr. Michael Kenna, (405) 743-3900 or Dr. Kimberly Erusha (908) 234-2300 at the USGA.

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Management of Fungicide Resistance

By Patricia L. Sanders, Plant Pathology Department, Penn State University

Fungicides can be divided into two groups according to where they act to protect plants. CONTACT or PROTECTANT FUNGICIDES are those that stay on plant surfaces and provide a barrier against the fungi that cause disease. ERADICANT or SYSTEMIC FUNGICIDES are absorbed by plants, and thus can work to protect plants from within, in much the same way that antibiotics act to eradicate "Germs" within the human body. Most systemic fungicides also have protectant properties in that they can provide barriers to fungi on plant surfaces. Systemics have the advantage of long residual action, protection of plant crowns and roots, movement within plants to protect newly formed tissues, eradication of fungi already inside plants, and protection from washoff and weathering.

The chief disadvantage of systemic fungicides has been the problem of resistance to these fungicides in many important turf pathogens. Resistance in fungi to systemic fungicides occurs because these fungicides generally poison fungi only at a single location in their growth and development cycles. It is, therefore, relatively likely that some individuals will be present in populations of disease-causing fungi that are able to circumvent or short-circuit the poisoned site. These individuals will be able to grow and increase in the presence of the fungicide. With repeated, continuous application of the same systemic fungicide, the naturally resistant individuals in a fungal population will multiply until the population is composed primarily of fun-

gicide-resistant individuals, and disease control fails. This has happened in countries all over the world where systemic fungicides have been used. In the USA, most of the disease control failures from resistance to systemic fungicides have occurred on turfgrass. There are published reports of resistance control failures of Tersan 1991 on dollar spot, Subdue on Pythium blight, and Chipco 26019 on dollar spot and pink snow mold.

Identification and development of new fungicides is costly and time-consuming. Therefore, we must learn to use systemics in ways that will prolong their useful lives. In order to prevent or delay fungicide resistance in populations of disease-causing fungi, it has been suggested that systemic fungicides should be alternated or used in mixtures. However, there are very few published research studies on which recommendations for preventing or delaying fungicide resistance can be based. Alterations will be effective in cases in which the resistant individuals in the population are not as competitive as sensitive individuals. Thus, the population will fluctuate; the resistant component increasing when the resistance-prone fungicide is applied, and the more vigorous sensitive component increasing when the fungicide selection pressure is not present and the alternate fungicide is being used. Unfortunately, many times the resistant individuals in fungal populations are just as competitive and vigorous as the sensitive

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Fungicide Resistance...

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ones. In such cases, an alternating program will result in a steady increase in proportion of resistant individuals, until finally the population is predominately resistant – a condition we are trying to avoid. In populations of equally-fit resistant and sensitive components, mixtures have been found to be effective in keeping resistant proportions stable in experimental populations.

Assuming that fungicide mixtures are able to keep resistance levels stable in fungus populations, they must be effective in controlling disease. Obviously, we cannot use full rates of fungicides in mixtures, because to do that would increase financial and environmental costs. We need to be sure that reduced rates of fungicides in mixtures will give satisfactory field control of diseases. Field and greenhouse studies have shown that reduced-rate mixtures can give disease control equal to, and sometimes greater than, the additive control of the individual mixture partners alone at the reduced rate. Although much more research is needed, it appears that reduced-rate mixtures can give acceptable field disease control, as well as delaying problems with resistance.

There are several important things to consider when selecting fungicides for use in alternations or reduced-rate mixtures. First, only fungicides with different ways of controlling the target fungus can be used in alternations or mixtures to delay or prevent control failures resulting from fungicide resistance in fungal populations.

The three systemic fungicides registered for Pythium blight control (Banol, Aliette, and Subdue) have different modes of action, and therefore can be used in alternations or two-component, half-rate mixtures for resistance management and disease control. Three-component, third-rate mixtures of Banol/Aliette/Subdue may also be effective for these purposes, but research to test this is not completed.

The broad-spectrum systemic fungicides that control other turf diseases fall into three groups according to their mode of action: the benzimidazoles (Tersan 1991, Fungo 50, CL 3336), the dicarboximides (Chipco 26019, Vorlan), and the sterol inhibitors (Banner, Bayleton, Rubigan). Any fungus that is resistant to the one of the benzimidazole fungicides will be resistant to them all. The same is true with the dicarboximide and sterol inhibitor groups of fungicides. Therefore, for resistance management, broad-spectrum systemic fungicides must be mixed or alternated BETWEEN but not WITHIN groups. Systemic fungicides may also be mixed or alternated with any contact fungicide that will give the disease control desired.

In addition to mode of action differences, the length of disease control provided by mixture components must be matched to avoid resistance selection. If a short-residual fungicide is included in a mixture for delaying resistance, an interspray of the short-residual chemical probably will be necessary.

If they are available, it is probably much better to use systemic fungicides in mixtures for resistance management. The reason is that the turfgrass plant itself can "unmix" mixtures of contact and systemic fungicides. If you apply a

contact/systemic mixture, the mixture will be present on plant surfaces, but the systemic fungicide will be present alone inside the plant. As an example, in the case of a Subdue/Fore mixture, Subdue alone will be acting against **Pythium** that already has invaded the plant. For this reason, mixtures of systemics are safer for resistance delay than contact/systemic mixtures.

The management of fungicide resistance in populations of disease-causing fungi is an area where much more research is needed. Additive, synergistic, or antagonistic effects may be possible with particular fungicide mixtures. It is, therefore, important that alternations and mixtures of various fungicides be tested, both for disease control and for resistance delay, in as many use settings and turfgrass/pathogen systems as possible.

Although there is much more we need to know about how we can best use systemic fungicides to avoid disease control failures from fungicide resistance in fungal populations, one thing is clear. We cannot safely use any systemic fungicide repeatedly and exclusively for disease control. Sensible and prudent use of systemic fungicides dictates diversity in chemicals used. Turf managers should be very skeptical of recommendations suggesting that any systemic fungicide can be used alone and continually without risk of resistance problems.

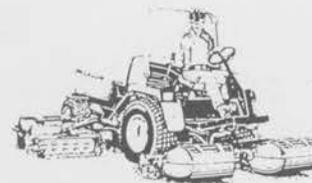
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Is the USGA "Two Faced" When it Comes to Course Maintenance?

For those of you who do not frequent Turfbyte (an electronic bulletin board for golf course superintendents lucky enough to have a computer equipped with a modem), there has been a fair amount of lively discussion lately concerning the condition of Pebble Beach's greens during the U.S. Open Championship. Since Turfbyte regulars are predominately superintendents, the discussion centered around the turf conditions and the obvious stress on the greens during the last few days of the championship. The USGA was the target of some pretty stinging criticism, the most serious of which in my mind was the feeling that we (the USGA) are "two-faced" in our recommendations to clubs around the country. The argument was basically this: How can the Green Section agronomists visit clubs and emphasize the need to avoid excessively low mowing to produce extremely fast greens, and then hold the Open Championship on television with exactly those conditions on display for the world to see?

Having been a superintendent at one time and having worked at a club where green speed was a frequent issue, I fully understand the argument these guys are making. It is a pain when a championship the caliber of an Open is on TV and the low handicappers in your club all decide they ought to putt on greens just as fast (Actually, The Masters was always my biggest headache since it took place at a time of the year my course was trying to recover from whatever winter damage had been suffered. I didn't even know the superintendent at Augusta National

but I sure hated the guy who prepared a course that was "perfect" and on TV while the greenest thing on my course was the *Poa annua* that I missed with the spray rig that winter). It is a difficult situation when players at the local club think they ought to be playing on the same conditions they see on TV.

Generally, the superintendents on Turfbyte agreed that efforts should be made to let non-superintendents know more about what goes on behind the scenes and why what is seen on TV is not the "real world." I happen to agree with them and feel at least three major issues deserve discussion in this regard.

ISSUE #1

Why does the USGA make the course so hard, the greens so fast, the rough so high? Are they trying to embarrass the players?

Chances are you've heard these questions, although they were probably expressed more as accusations.

I can't say I have been around a lot of championships in my eight years in the USGA. However, I have been to a few and know many of the people responsible for conducting the events. My observations are that **the single most important goal of a USGA championship has in every case been to identify the best player.** Do people really believe there are secret meetings behind USGA doors where staffers decide to embarrass somebody? I think it is possible that the USGA feels more strongly than others that par is still a great round of golf.

One of the best analogies (I love analogies) I have heard concerning the Open setup is comparing this national golf championship to the country's auto racing championship - the Indianapolis 500. Can you imagine a 500 where there was a speed limit of 55 mph? Would you be able to find out who was the best driver under such limitations?

ISSUE #2

Non-championship golfers think they want championship conditions.

It is understandable that players want the same conditions they see on TV. After all, they emulate every other aspect of the best players, including their clubs, shoes, swing, and style of shirt. However, there are some very large assumptions made when this emulation is carried on to course setup. Average and even above average players simply do not have the skills of those they see on TV.

Again, analogies are useful in this discussion. These players might point out that when they play tennis, or football, or bowl, or even shoot pool, they are playing on the same conditions as the professionals in those sports so why not golf? My rationale is that these are what I like to call "linear" sports. The playing fields are based on rigid, angular lines that remain constant throughout the game, from day to day, from place to place. These are two

continued on next page

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USGA and Course Maintenance...

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dimensional sports - one being physical skill and the other mental. The playing "fields" have only a limited influence in the player's success or failure.

In my eyes, golf is a three-dimensional game. Rigid, angular lines have no place in golf. Contoured fairways, flowing bunkers, and undulating greens are viewed by virtually all golfers as more desirable than fairways that look like runways or hot dogs, perfectly round bunkers, and flat greens. Most importantly, in addition to the mental and physical aspects of the game, golf adds a third dimension - the course itself. **And in the case of golf, the playing "field" is equally influential on the outcome as the other two aspects.**

All this leads to an obvious conclusion. A course should be set up commensurate with the skills of those who are to play it. In a USGA Championship, the players are all exceptionally skilled and the course can and should be set up appropriately. However, daily play on courses will involve players from one end of the talent spectrum to the other. A middle ground must be established so that everyone can find something they enjoy. Let's all face facts here. Few if any players at the club level pay as well as the folks they see on TV. They may think they want the same conditions, but they would quickly find they are not up to the challenge. You know those flatbellies that sit in the Nineteenth hole and watch the pros putt on greens with speeds over ten feet, and then think the greens on their local club's course should be the same? I sometimes wonder how fast they drive home after watching the Indianapolis 500 on television.

Interview Experiences



Mike Meindertsma

I recently had the opportunity to talk to several MSU students regarding their academic experience, their goals, and their professional direction. This opportunity first arose during the annual Mock Interview Day on December 10th and then again on December 15th when I was on the interview committee for the NMTMA Scholarship Award.

These experiences left me with feelings of happiness, due to the student's knowledge and preparation, and of excitement, due to the enthusiasm and confidence these future leaders conveyed.

During the Mock Interview exercise, I spoke with six different students for approximately forty minutes each. The day was structured to be representative of a true interview, complete with my providing a job description and the student providing a resume in advance. During this exercise I was able to demonstrate and use my personal interview philosophy and techniques. The underlying premise being that

ISSUE #3

Can we have championship conditions even if we want them?

The next issue is one I feel is perhaps the most crucial. Most superintendents realize that the conditions seen on TV during a major championship simply cannot be maintained for an extended period of time. Unfortunately, many players have virtually no knowledge of the steps necessary to produce such conditions. Starved greens, microscopic cutting heights, unlimited labor and equipment, and the course dried to the bone are not conditions that can be maintained for more than a few days at a time in most climates. This is truly "Management on the Edge" (refer to the *Green Section Record* article of July, 1987 by the same name). It takes months and sometimes years to prepare a course for a major championship. Often, the complete reconstruction of greens and tees, reshaping of fairways, and yes, even the removal of trees that have been allowed to ruin the architecture of a classic design, must be accomplished prior to the event. Attempting to maintain championship conditions on a daily basis would destroy most courses.

As the Green Section staff travels the country, we often find ourselves expressing these facts to those present on the tour of the course. We also frequently visit clubs that are "pushing" the course way too hard in an effort to provide championship conditions. As a result, we often find ourselves making recommendations to raise cutting heights, fertilize more, and accept slower greens. These are in direct contrast to preparation for an Open. Is this "Two-faced"? **No. It's just common sense.**

Credit: *Mid-Continent News*, James Moore

the interview, at this level, is simply an opportunity for information exchange. A two way communication is what I feel should take place. It is as important for the interviewee to find out as much about the interviewer as possible just as the interviewer must find out about his candidate. The students who I had the pleasure of talking to all shared their information very well.

The other interview was for the NMTMA Scholarship award. This was a panel interview where a five member panel interviewed the candidates. Although this format can be potentially intimidating, the students were generally poised, prepared, and able to think on their feet quite well. This, too, was a very pleasant interviewing experience for myself and the committee.

These two experiences left me with very positive feelings. It is obvious that the folks at MSU give their students plenty of time and attention. Also positive is the diversity and strength of the interviewee's backgrounds. The personal presentation, the communications skills and the sincerity of the students all made me feel very comfortable as to the future of our industry.

Mike Meindertsma

Beard, Gibeault Honored For Distinguished Service by GCSAA

GCSAA News Release - December 4, 1992

The Golf Course Superintendents Association of America's (GCSAA's) board of directors has selected Dr. James B. Beard and Dr. Victor Gibeault to receive the association's 1993 distinguished service awards.

Beard's and Gibeault's dedication and outstanding contributions to the golf industry will be recognized at the Opening Session of the 64th GCSAA International Golf Course Conference and Show on Tuesday, Jan. 26, 1993. The conference and show will be held Jan. 23-30 in Anaheim, CA.

GCSAA President William R. Roberts, CGCS, said, "Each of these men has made an exceptional contribution of the golf course superintendent's profession. I can think of no other individuals as deserving as Drs. Beard and Gibeault to receive GCSAA Distinguished Service Awards."

Beard, who is now director and chief scientist of the International Sports Turf Institute, has devoted 35 years to turfgrass research and education. During this service, he received numerous accolades and touched the lives of many golf course management professionals.

He retired this year from his position as professor of turfgrass physiology and ecology in Texas A&M University's Department of Crop and Soil Sciences, where he had been since 1975. Prior to that, he had been at Michigan State University for 14 years. He was a National Science Foundation graduate fellow at Purdue University, where he obtained his master's and doctoral degrees.

He has written several books that are widely used in turfgrass management instruction, including *Turfgrass: Science and Culture*, commonly referred to in the

industry as "Beard's Bible."

Among Beard's honors and awards have been the USGA Green Section Award, The American Library Association's Oberly Award, and the International Turfgrass Society's Distinguished Service Award. In 1990, Beard was named a fellow in the American Association for the Advancement of Science.

Beard has been an Affiliate Member of GCSAA since 1984.

"Dr. Beard is considered by many to be the premier turfgrass researcher of the last several decades," said Roberts. "He has always been a contributor to the educational and professional growth of golf course superintendents throughout the world."

Gibeault has been an extension environmental horticulturist at the University of California-Riverside for 23 years. He has been a member of the USGA Turfgrass Research Committee since 1985. Gibeault has written numerous reports and research articles for golf course technical publications, and is the editor of *California Turfgrass Culture*.

Gibeault works closely with most of the local superintendent's associations throughout California. He is a member of the American Society of Agronomy, The International Turfgrass Society, and the Northern and Southern Turfgrass Councils.

"Vic's dedication and service to the golf community have significantly advanced the profession," said Roberts. "There are few people in our field who are as highly respected and have touched as many individuals as Dr. Gibeault."

GCSAA members and affiliated chapters submit nominations for the GCSAA Distinguished Service Award.

Highlights of Recent Changes to the USGA's Green Construction Recommendations

Robert Vavrek, USGA Green Section.

The USGA's recommended method for putting green construction has been revised three times over the last 30 years. Each revision was an effort to integrate the current level of scientific knowledge with the sound practical experience of the Green Section staff. The underlying intent of the USGA has always been to provide a method for greens construction with the highest potential for success under a wide range of environmental conditions.

During 1991, Dr. Norm Hummell, associate professor at Cornell University, spent his year on sabbatical leave working with the USGA to update and standardize the laboratory procedures used by various labs that test the construction materials used to build putting greens. After an extensive review of the scientific literature pertaining to the use high-sand content root zone mixtures for turf, a number of revisions to the USGA specs were recommended.

An Advisory Committee of soil scientists and Green Section Staff was assembled to review the recommendations. After review, the proposed revisions were submitted to an international group of

approximately 30 soil scientists, lab personnel, architects, and industry personnel for comment and further suggestions. The USGA has utilized a broad base of scientific knowledge and practical experience to achieve several goals regarding the current revisions:

- 1: To increase confidence in the specs by standardizing lab procedures.
- 2: To reduce the cost of building greens to USGA specs by removing unnecessary steps during construction and to provide more flexibility in choosing construction materials.
- 3: To utilize the most current level of scientific knowledge to develop a comprehensive set of recommendations.
- 4: To identify areas in our knowledge of greens construction methods that are poorly understood and will require further research efforts in the future.

The following is a summary of the major changes:

Continued on next page

Changes to the USGA Green Construction Recommendations

Continued from previous page

SUBGRADE: The subgrade can be shaped to facilitate drainage and need not conform exactly to the proposed surface contours. However, the contours of the gravel layer must closely conform to the finished grade.

A geotextile fabric may be used between the gravel layer and an unstable subgrade soil, i.e. muck, expanding clay, etc.

DRAINAGE: Drainage trenches shall be a minimum of 8 inches (20 cm) deep.

Drain lines shall be installed no more 15 feet (5 m) apart.

The main line shall be extended for a short distance from the back/high side of the green to facilitate the installation of a clean-out port.

A perimeter (smile) drain shall be installed along the low edge of the green/surrounding-soil interface and shall extend to the first set of laterals.

GRAVEL: Angular particles are preferred for stability – to facilitate shaping; pea gravel is, of course, acceptable.

Gravel of questionable weathering/mechanical stability must pass the LA Abrasion test and/or the sulfate soundness test – ASTM tests C-131 and C-88, respectively.

The need for an intermediate sand layer can only be determined by a soil laboratory and depends upon the relationship between the particle size distributions of the gravel and the root zone mix. Where an intermediate sand layer is required – no more than 10% of the gravel can be retained on a 1/2 inch sieve, at least 65% must pass through a 3/8 inch and be retained on a 1/4 inch sieve, and no more than 10% can pass through a 2mm sieve.

INTERMEDIATE SAND LAYER: The acceptable particle

size has been expanded from 90% of the particles between 2mm and 1mm, to 90% between 4mm and 1mm.

ROOT ZONE MIXTURE: The acceptable particle size distribution of the USGA root zone mix is summarized in the accompanying table.

Allowance has been made for more fine sand (0.25mm - 0.15mm) but less very fine sand (0.15mm - 0.05mm).

The peat source must be a minimum of 85% organic matter by weight. Other organic composts should be aged for at least one year and must be proven to be non-phytotoxic to the turf by the supplier. The final organic content of the mix must be between 1-5% by weight (ideally 2-4%).

If soil is to be used in the mix it must have a minimum sand content of 60% and a clay content between 5% and 20%. The final mix must still conform to the revised guidelines for particle size distribution.

Several root zone physical properties have been modified:

Total Porosity: 35-55% (previously 35-50%)
Air-filled porosity: 20-30% (previously 15-25%)

Saturated conductivity: (percolation rate)

Normal range: 6-12 in/hr (15-30 cm/hr)
Accelerated range: 12-24 in/hr (30-60 cm/hr)

SOIL FUMIGATION: Sterilization required prior to establishment of turf only 1) in areas prone to severe nematode problems - 2) in areas prone to grassy weed or nutsedge problems, or 3) when the root zone contains unsterilized soil - otherwise optional.

The complete recommendations will be available during January 1993. For a copy, contact the USGA Green Section, Great Lakes Region, 11431 N. Port Washington Road, Suite 203, Mequon, Wisconsin, 53092, or call 414-241-8742.

Particle Size Distribution of a USGA Root Zone Mix

Fine Gravel	Very Coarse Sand	Coarse Sand	Med. Sand	Fine Sand	Very Fine Sand	Silt	Clay
3.4mm to 2.0mm	2.0mm to 1.0mm	1.0mm to 0.5mm	0.50mm to 0.25mm	0.25mm to 0.15mm	0.15mm to 0.05mm	0.05mm to .002mm	LESS THAN .002mm
MAX 3%		AT LEAST 60% OF THE PARTICLES MUST BE WITHIN THIS RANGE		MAX 20%	MAX 5%	MAX 5%	MAX 3%
10% Maximum Greater Than 1.0 mm				10% Maximum Less Than 0.15 mm			

PMA Canceled in '92

W.A. Cleary Corporation will voluntarily cancel the final use of PMA ornamental TURF as of 11/17/92 due to the cost of re-registration. Most mercury products were canceled in 1976. There will no longer be any agricultural use of this chemical following its cancellation. Existing stocks of this product may be sold and used until exhausted.

Change of Address, Membership Application info available

Any member with a change of address should immediately contact
Thomas J. Reed at 3733 Apollo Drive, Traverse City, MI 49684.

He should also be contacted if any person would like to apply for membership in NMTMA.

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UST Leak Test Deadline Nears

Underground storage tanks that were installed between 1975 and 1979 must have leak detection tests performed by December 22, 1992 to be in compliance with the Environmental Protection Agency's (EPA's) regulations.

David Wiley of EPA's Office of Underground Storage Tanks says tank operators may conduct several types of leak detection tests to comply with the rules.

One of the more effective tests is a tightness and inventory control test, which Wiley says involves the testing of the tank's tightness and using a dipstick to monitor daily levels of the tank's contents. The dipstick measurements are compared to amounts put in or taken out of the tank. Any difference in the numbers could alert the operator of a tank leak.

Other common tests include groundwater and vapor monitoring methods, which Wiley says are not as effective.

For more information on the deadline and compliance, contact the Golf Course Superintendents Association of America (GCSAA) at 913-832-4470.

Credit: GCSAA Government Relations Briefing, 11/92

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Proposed Revisions to the NMTMA Articles and Bylaws

The membership will vote on the following changes at our March meeting (time and date to be announced).

Article II Addition:

Now reads - "... with a view toward efficiency, economy;"

Changed would read - "... with a view toward efficiency, economy, a responsible concern for the environment;"

Section V - G. Sustaining Members

Now reads - "... including those of voting and holding office as now specified under Article IV."

Change would read - "... including those of voting, and holding office after acquiring (3) years membership with the Association, as now specified under Article IV."

Section VII - F.

Now reads - "The annual meeting of the Association will be held in October at which time election of board members will take place."

Change would read - "The annual meeting of the Association will be held in October at which time election of board members, from qualified candidates, will take place."

New Book On Maintenance For Golf Courses

Trey Rogers of Michigan State University will be editing a book called *Superintendents' Handbook for Golf Course Maintenance and Construction*. The book will be published by Lewis Publishers, the leading publisher of turfgrass books. It will consist of a "cookbook" format with the chapter topics divided into putting greens, fairways, roughs, wild-life management, equipment, IPM, etc.

Each chapter will consist of "contributions" of maintenance and construction practices that superintendents have successfully used at their golf course. Contributions will cover areas from tee marker strategy, to philosophy for green committee meetings, to how to build a retaining wall. Contributions will be 1-5 pages in length, and will include photographs to aid in describing the practice.

Contributions at all levels from superintendents across the country will be accepted and reviewed by an editorial board of distinguished superintendents. All contributions will receive full credit.

This is an excellent opportunity to give back to the industry, and to receive full recognition now and forever in a published form.

For more information and/or to receive a contribution packet, please write:

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Golf Course Photography

By Bob Maynard, F-stop

Photographing your golf course can be a challenging undertaking; one that might lead to frustration and disappointment if not approached with the proper understanding of what it takes to succeed in capturing the beauty that you see there so often. There are a lot of details to be considered before a finished picture can be created. The purpose of this article is to familiarize you with some of the procedures that will increase your percentage of good golf course photographs.

The first consideration should be what kind of equipment to use. The larger format cameras, such as 102 and 4X5, will yield the best quality negatives and slides for enlargements and reproduction in magazines, but realistically speaking, most people reading this article will be using some type of 35mm camera. Some of this equipment will be a fixed lens type with no options for changing lenses. Others will have the capability of adding wide angle and telephoto lenses to the equipment for increased flexibility. But no matter what type of equipment that you have at your disposal, you can get better photographs if you become more aware of what to do with your equipment. My recommendations would be to have no smaller than 35mm format with both wide angle and telephoto lenses when possible. I'll discuss the use of these lenses later.

The type of film that you will use will be determined by your primary end use of the images. If your primary use is for reproduction in a magazine then your choice should be slide or transparency film. Magazine publishers use slides and transparencies to make color separations for printing and can get the highest color saturation and detail from this medium. Slide film is more exacting in its exposure and therefore can get be more difficult to get good results for the inexperienced photographer. Print film would be easier to use because the exposure isn't as critical and it will be less expensive for enlargements, but you will not be able to get the deep color saturation that you can get in slide films that are properly exposed. Remember that the lower "ISO" rated films will render the highest quality results, with finer grain structure for enlargements and reproductions. Proper care of your film both before and after exposure is very important to your color stability. Always refrigerate your film before and after exposure. Be sure if you do refrigerate your film that you allow a couple of hours for the film to warm up in the canister before using to avoid condensation. Have your film processed as soon after exposure as possible for the best color. Above all, don't store film in your car during hot days.

Perhaps the single most important element in your photograph is the lighting. It makes or breaks a landscape photograph. Cultivating an ability to recognize good lighting when you see it should be your highest priority. Look at any photograph that you like and ask where the lighting is coming from and why it makes the photograph good. Study the direction of light every time you view a picture and become aware of its effects on the landscape. Low afternoon light can define shapes on a golf course that you were not aware of at noon. Dark foregrounds and brightly lit greens can lead

the eye to the green, which is the main subject. Undulations in the green that are such an important factor in every golfer's game become well defined in the low angled light of late afternoon. The way that light strikes the green or fairway of a golf hole can make a remarkable difference in the impact of a photograph.

Generally speaking, having the light source at your back or sides will render the best color saturation on your shots and will define landscape shapes. When shooting with the light at your back, be careful not to get your shadow in the foreground of your photograph. Because the layout of your course doesn't change from hour to hour or day to day, the only variable that you have is to view the lighting on your course at different times during the day and determine which is the optimum time for a particular hole. If you are dealing with late afternoon diminishing light as your optimum time for a particular hole, there may be only a few minutes during that time that the hole can best be photographed. Other holes can only be photographed on overcast days because the greens are always showing shadows from surrounding trees when bright sun is used. Being aware of this and taking advantage of the lighting will render the best possible image. Shooting on a crisp clear day that has a mixture of deep blue sky and white clouds adds another dimension to your photographs. Avoid those hazy bald sky days because there is no color saturation.

Your images should be well thought out for both lighting and composition. It is equally as important to know what to include as what to exclude. Try to compose your images to be as simple and uncluttered as possible, eliminating distracting elements and backgrounds so as to focus the viewer's attention on the key element. Get in close, shoot from the back of the green with a wide angle lens, shoot from the tee with a normal lens, shoot from the fairway with a telephoto lens, get a high angle, or a low angle, shoot from every imaginable angle and you'll surprise yourself with the limitless possibilities that some of the holes present. Be selective about a certain feature that makes the hole unique. Sometimes you can even include two holes effectively in the same photograph.

Be careful to meter the landscape carefully for proper exposure of your film; bracket your exposure by taking photographs at both the correct exposure according to your meter and at one F-stop above and below that exposure. This practice will show you, especially in slide photography, that one F-stop can make all the difference in a slide's color saturation. A few extra frames exposed at the perfect lighting time for a hole is cheap insurance that you have the image properly exposed. Make notes of your exposure in a notebook for later reference. This will increase your knowledge for more predictable results every time.

Most important of all is to have fun trying to capture that special beauty that only a golf course can offer. The more that you shoot and evaluate what you shoot, the better you will become at photographing your course.

Credit: Through the Green, March/April 1990

Communications, Credibility and Fairness

Morale problems such as absenteeism, turnover or poor level of performance can be closely related to your employee's sense of whether or not they are being treated fairly. Even if their jobs are less than satisfactory, studies show that people will often put up with unpleasant duties as long as they feel that their organization makes an effort to treat them fairly, gives them the sufficient job-related information and makes them feel a part of the overall operation.

One of the primary factors in employee morale is the manager's credibility. The more your employees believe you and support you, the more effective you become as a supervisor. In a way, it's similar to having a good reputation in that it must be earned and continually maintained.

Consistency is one of the marks of a good manager. People like to know that you will respond to them tomorrow the same as you did yesterday. It is also important that you avoid treating one employee more favorably than another. It is only human that you like some of your people more than others, but don't let your personal tastes affect the quality of your management. Favoritism shows up first in this area of personal attention, and your people will pick up on it very quickly.

An effective manager also keeps a close rein on his emotions. Losing your temper rarely solves a problem, and most employees work best when their surroundings are not in an uproar.

Broken promises can do more to dampen morale than anything else. Do things when and how you say you will and follow through on your plans and programs. Even though your people might understand it's not always your fault when things don't work as planned, you should avoid making promises unless you know you can deliver.

Be available to your employees for advice and help. People appreciate a leader who will take the time to work with them in solving problems and providing support. Be even-handed in giving coaching, guidance, praise and personal favors.

No matter how good a supervisor you are, sooner or later you will have to discipline an employee. Make sure your discipline is both appropriate and consistent. The punishment not only fits the violation, but also the circumstances and past record of the offender, and it must be enforced each time there is a violation.

Credit: Forefront

BATS: Safe Insect Control

In an age when landscape designers are looking for environmentally safe insect control, help comes from a rather unlikely source – bats.

In North America the majority of bats are insect eaters and, in fact, major predators of night-flying insects. Almost half of these species may use artificial roosts.

The use of bat roosts for insect control is not a new idea. At the turn of the century, Dr. Charles A. Campbell built artificial roosts in Texas to try to control mosquitoes in order to eradicate malaria. He based his idea on birdhouses, artificial cavities provided for birds and was nominated for a Nobel Prize. One of his towers, a "hygieostatic bat roost," is a Texas State Historical Landmark. And it still has bats living in it.

Around the time of Campbell's experiments, bat houses were being used in Europe. In the past decade, they have been given consideration in North America largely through the efforts of Bat Conservation International of Austin, Texas. Nature, of course, has used natural bat controls for a long, long time.

Backyard habitats include bat houses that hold from 20 to 100 bats. These can be mounted under the eaves of buildings or in trees. The roosts look like bird houses, the largest being about two-feet-high, one-foot-wide, and one-foot-deep. The bottom is open. Inside are vertical partitions spaced from 3/4 inch to 1 1/2 inches apart.

The common little brown bat, *Myotis lucifugus*, is one

species likely to move in. They can eat up to 600 mosquitoes per hour. Another possibility is the big brown bat, *Eptesicus fuscus*, "big" only in relation to "little". They will eat Japanese beetles.

Some bats eat half their body weight in insects each night. Along with mosquitoes, gnats, midges, Japanese beetles and black flies, bats eat farm and garden pests such as cutworm and cornborer moth.

Because bats are nocturnal, they will not interfere with the homeowner who has a purple martin colony, a bluebird house, or is encouraging other insect eating birds on their property.

For a municipal design project, a Missouri style bat roost can be used. Seven-feet by four-feet by three-feet, it can hold 1,000 bats. These roosts have been successful on golf courses and in park and recreation settings in a number of states. As a community conservation effort, it has both educational and public relations value.

Bat roosts are not for every project but with certain conditions, a supply of insects, and a source of water, it may be a possibility. There is a scarcity of tree cavities used for roost sites, a loss of habitat for these beneficial animals.

For more information contact the APLD's Committee on the Environment and read *America's Neighborhood Bats*, by Merlin Tuttle.

Credit: The Landsculpture, May 1992

NMTMA HAPPENINGS

Scotland's Yard, a new 9-hole par 3 course, located in Walloon Lake, MI, may open for play in mid-August of 1993. Good luck to Scott Kuhlman on this endeavor!

Spartan Distributors will hold its annual Spartan/Toro University March 10-11. Watch for details.

Health study to examine mortality among superintendents

A new independent scientific effort to study the causes of death among golf course superintendents is being underwritten by the GCSAA Scholarship & Research program.

The study is designed to provide basic evidence about what links, if any, exist between long-term pesticide exposure and certain cancers and illnesses that have been previously identified as "pesticide-related."

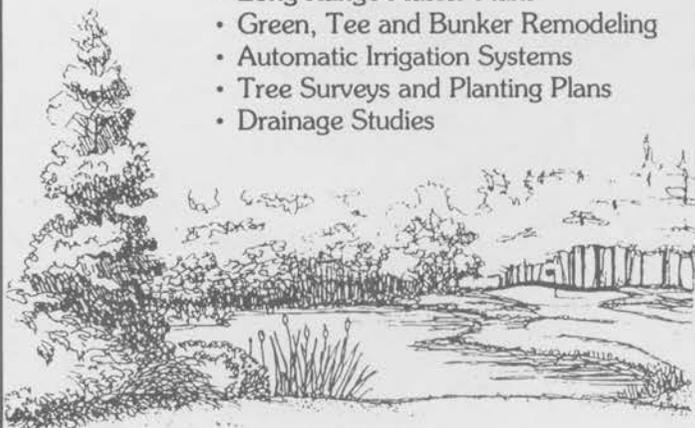
"We're taking a giant step forward in research on the health questions surrounding golf course management," said William R. Roberts, CGCS, president of GCSAA and a member of the advisory panel that reviewed the proposed study. Roberts said that the study will provide a baseline for an ongoing study of mortality among GCSAA members.

Earlier this fall, a special advisory panel including scientists, superintendents, federal regulatory officials and industry representatives met at GCSAA headquarters to review plans for the study and recommend qualified researchers. In November, GCSAA S&R sent a request for proposals to a select group of scientists. Plans call for the researcher(s) to be selected before the GCSAA Conference and Show in Anaheim.

Credit: GCSAA S&R News Release

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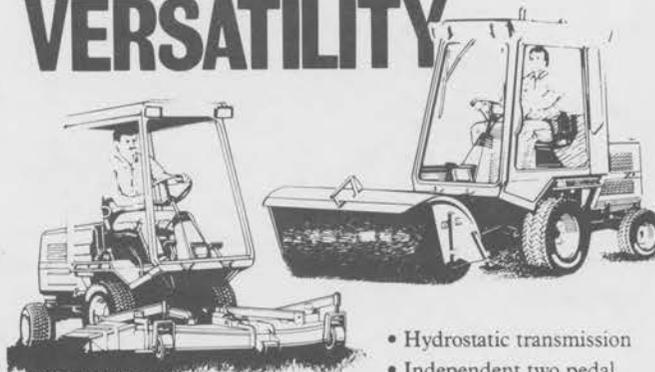
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'Clean Sweep' Pesticide Collection: A Northern Michigan Success

By Mike Morris, superintendent, Crystal Downs Country Club

For several years the Northern Michigan Turf Managers Association (NMTMA) attempted to organize and sponsor a chemical disposal day for outdated or unusable turfgrass pesticides held in storage in northern Michigan golf courses. The NMTMA went as far as surveying its membership for disposable materials, contacting various disposal agencies and fully researching the regulatory and legal aspects of such an endeavor. However, the tremendous costs of pesticide disposal and the logistic problems of obtaining EPA facility identification and manifests for the NMTMA membership proved to be insurmountable.

In January of 1992 the NMTMA heard about two programs that would be implemented later that year in Michigan's northwest lower peninsula. The U.S. Environmental Protection Agency (EPA) was to sponsor the "Lake Michigan Drainage Basin Chemical Disposal Program" which would subsidize the Michigan Department of Agriculture's (MDA) "Clean Sweep Program."

NMTMA president Jeffrey Holmes promptly contacted and met with the parties involved, expressing the need for the golf industry's participation in these programs as well as the willingness of the NMTMA to help fund and coordinate the disposal day. Holmes's efforts ensured access to the disposal day for all of the NMTMA member properties. With the wheels in motion, a remarkable cooperative effort among the EPA, MDA, Michigan DNR, M.S.U. Cooperative Extension Agents and the NMTMA made the long-awaited disposal day a reality on September 12, 1992.

This disposal day was the first for golf course participation in Michigan, but was the third collection program to have taken place in northern Michigan in four years. A pilot program in 1988 and a twenty-four (24) county collection program in 1990 targeted non-golf growers and applicators. The 1990 program collected approximately 120,000 pounds of materials including DDT, Chlordane and Lead Arsenate. Building upon these earlier program's formats and implementation, the MDA continued to pursue its goal of eliminating outdated or suspended pesticides that could find their way into the Great Lakes. In a news release from the MDA, Director Bill Schuette stated: "The Michigan Department of Agriculture is absolutely committed to protecting the environment by removing outdated pesticides and recycling empty pesticide containers... We are confident these programs will succeed in greatly reducing any potential threat that an accidental release of these chemicals would pose to ground and surface water." (January 31, 1992)

Planning for this project began with the Extension Agents contacting all growers and applicators. The NMTMA publicized the program in its newsletter *Turf Times*. All interested participants were surveyed and required to submit information about the chemicals to be discarded: all information was kept confidential. The Extension Agents then made follow-up calls to all participants certifying the information on the surveys. Many participants included chemicals which could still be used, and these individuals were encouraged to use the products according to label directions in order to keep the cost of the program reasonable. Then, in a final coordinated effort, an actual list of chemicals was established; disposal costs were calculated; a waste hauler was selected; and the

participants were contacted again to confirm the chemicals approved for disposal and the participant's appointed drop-off time.

The Grand Traverse County Department of Public Works garage was chosen as a drop-off site because of its central location, distance from residential areas and facilities for handling traffic and materials. The waste hauler was selected by a competitive bid among four licensed disposal companies, and was on-site to assist with the unloading, to provide drums and containers, to properly label and manifest the materials, to provide spill clean-up if necessary, and to transport and dispose of the materials. As the participants drove up to the garage, the Extension Agents checked the participant's appointment and chemicals with the approved list, and also had each participant fill out a survey.

On September 12, seventy-five (75) participants disposed of a wide range of chemicals free of charge. Liquid products totaled 1,262 gallons and dry products totaled 4,662 pounds. The total cost for disposal was \$37,607.50. The available funding for this project exceeded costs and came from the following sources:

The NMTMA	\$5,000.00
National Parks and DNR	\$2,823.50
MDA/EPA funding	\$34,750.00
In-Kind Support	\$6,608.00

Support from the NMTMA included money from the following chemical distributors: Tri Turf, Scotts Proturf; and United Horticultural Supplies. The program also received the support of the Inter-Tribal Fisheries Council. In the survey, the participants cited their main reasons for participating as:

- Concern for the environment
- Concern for health risks
- Concern about liability
- The product couldn't be taken to a landfill

And though the disposal cost the participants nothing, 31 percent of those surveyed commented that they would be willing to share in a percentage of the cost. Further details and survey results will be available through the M.S.U. Cooperative Extension Service.

Dr. Charles Cabbage, the MDA Environmental Coordinator, says that in 1993 this type of program will target the east side of the state. As turf managers, the NMTMA is very proud to have been associated with "Clean Sweep" as part of our continued efforts to promote environmental stewardship through the proper use, handling and disposal of agricultural chemicals. Efforts like "Clean Sweep" underscore another important aspect of the green industry -- our link to other fields of agriculture. We are all using the land and its resources to produce a crop which is beneficial to the well-being of our community and economy. It is clear that through the type of cooperation demonstrated in "Clean Sweep," everyone benefits from environmentally responsible management.

NO CALENDAR this issue. Our apologies.
Watch for the calendar in your next issue
of *Turf Times*.

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