



GCSAA AFFILIATE

Turf Times

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The newsletter from the Northern Michigan Turf Managers Association

NMTMA EXECUTIVE COMMITTEE

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Jeffrey Holmes

Vice-President
Michael Morris

Executive Secretary
Thomas J. Reed
3733 Apollo Dr.
Traverse City, MI 49684
Phone 616-943-8343

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Jon Maddern

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Jon Maddern

Newsletter Editor
Michael Morris
P.O. Box 1575
Frankfort, MI 49635

President's Message

The environment is certainly a key component in our daily jobs and needs to be protected and preserved for future generations. We are stewards of today and tomorrow, and in order to do a good job protecting the environment, we need to be educated and also practice doing the right thing. The future of our environment is only as good as each of us.



President Jeffrey Holmes

To help provide a safe environment for the years to come, our Northern Michigan Turf Managers Association helped to coordinate a chemical disposal day last September. This program went over very well and gave each of us an opportunity to rid ourselves of unwanted chemicals.

This year our thrust is to get started in recycling plastic pesticide containers. There will be three different dates and locations to get involved in the plastic container recycling.

Before we talk about the participation dates, there are a few preparation procedures that we need to follow.

After emptying your container it needs to be triple rinsed, punctured and made unusable. All foil at the top needs to be removed and the caps thrown away. Labels on the outside need to be removed as well as possible. All chemical residue needs to be rinsed from the threaded cap area and the outside of the container.

A key point to remember is that if your containers are not prepared properly for the recycling machine, they will go back home with you.

The dates for the recycling days begin August 20th at the John Amos Farm on Monroe Road in Traverse City from 8:00 a.m. to 12:00 p.m.

The next available recycling date is August 23 at the Northwest Research Station in Traverse City. Hours of operation are 8:00 a.m. to 12:00 p.m.

The last day to recycle your containers is August 24 in Bear Lake at the Cooperative Extension Office. Once again, hours of operation are 8:00 a.m. to 12:00 p.m.

When these containers are recycled they are used to make new pesticide containers and other types of plastic products that do not contain any food products for humans or animals.

Let's make a good concerted effort toward the plastic container recycling program. It will be successful if we all participate. Should you have a small quantity, work with a property or two near you and join together to make the trip. Every little bit helps to make the program a success.

Don't forget we are running out of landfill space, plus you are reusing the plastic when you recycle.

Thanks for your efforts put forth in supporting this program.

Jeffrey Holmes, President

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Dowsing - An Ancient Art in Modern Use

By Jeffrey T. Dorrell, Superintendent, Cadillac C.C.

Dowse \ 'dauz \ verb - To dowse is to search with the aid of a hand-held instrument (such as a divining rod) for anything.

When a superintendent first demonstrated the technique of dowsing to me, I had the typical knee-jerk reactions of skepticism and disbelief. Yet it quickly proved its worth on the golf course for finding buried water pipes, drain lines, valves and electrical wires. Also, I found that with a little practice I could perform the technique myself. As irrigation technician on a course with an aging irrigation system and frequent problems, my divining rod became a tool of daily use. For anyone with underground irrigation, unless you really enjoy digging keep an open mind and give this a try. It has been my experience that it takes no special clairvoyance or faith and with a little patience anyone can learn to dowse.

History

The actual origins of dowsing are unknown. Historians point to some obscure references in Greek Mythology and to Biblical passages of Moses smiting the rocks with his staff and water gushing forth (Exodus XVII, 5-6). Written references to dowsing began in the 14th century and an engraving of a dowser at work is dated 1550. Records of scientific investigation on the subject began to show soon after the 15th cen-

tury and continue today. Volumes have been written on the subject and still no real explanation has been found. Theories of ESP, electro-magnetism and unconscious muscle movement have been put forth but none fully explain this phenomena.

Much of the problem with trying to scientifically explain dowsing is its wide variety of equipment, techniques and results. The classic forked stick is only one of many types of instruments used. Pendulum bobs, straight sticks, and coiled springs, which could be made of metal, plastic, or wood, all seem to work. Some of the more unusual equipment used includes household items such as scissors, rulers, utensils and even German Sausages. The results include the well-known reports of locating well water and metal ore of all types, lesser-known reports of finding missing persons and merchandise, and even solving crimes, diverting underground water, and diagnosing car trouble. Some dowsers have had successes using only a map of an area. During the Vietnam War, the U.S. Marines were trained in dowsing and used the techniques to locate enemy tunnels, booby traps, and ammunition caches. The reasons why it works may be unknown, but the results are well documented.

Technique

I have begun to notice tucked into the back of many turf
Continued on page five

Mechanic's Corner

By Dan Stratton, Head Mechanic, Crystal Downs C.C.

Hydraulic Hose Maintenance and Care

I came across this useful tip in the spring edition of *Toro's Turf Tips* (Issue 5, 1993).

"Inspect hoses regularly. Replace hoses that have bulges in them. Bulges indicate damage to the internal metal braid of the hose, or delamination of the hose material from the braid. Both conditions indicate a serious leak may soon occur. Replace all hoses that show signs of leaking where they connect to the end fitting. Replace all hoses that show signs of heavy abrasion of the outside surface.

Hose routing is important. Whenever replacing a hose, make sure that it does not bend excessively, contact moving parts, or stretch too tight. When tightening a hose connection, use two wrenches when tightening the fitting.

If a hose is equipped with O-ring face seals, replace the O-rings whenever you disassemble the connection. Remember that these O-rings are a special durometer, or hardness, and that use of "hardware store" O-rings will cause a leak.

WARNING: Keep body and hands away from pinhole leaks in hoses. Serious injury could result from improper handling. Refer to your Operator's Manual for instructions on checking for leaks."

Another thing we do at Crystal Downs to prevent hydraulic hose wear is to cover or wrap the hydraulic hose with pieces of old watering hose in areas where the hydraulic hoses tend to rub. Simply cut the old water hose to the proper length, slit it lengthwise, slip it over the hydraulic hose, and then fasten it in place with cable ties or duct tape. Be careful not to cover so much that you are not able to visually inspect the hydraulic hoses regularly.

Also, through distributors you can purchase hydraulic hose sleeves which protect the operator from the spray of a high pressure hydraulic hose break or leak.

Letters to the Editor

You can communicate directly with the NMTMA and your fellow members by writing to:

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c/o Mike Morris
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New GCSAA Poster campaign to educate Golfers

GCSAA NEWS RELEASE, LAWRENCE, KS - A new campaign to educate golfers has been developed by the Golf Course Superintendent's Association of America (GCSAA).

The campaign, composed of a three poster set, was developed to assist golf course superintendents in educating and informing golfers about three commonly misunderstood aspects of course maintenance: aerification, application of fertilizers and pesticides, and golf cart restrictions. The poster series explains why these procedures are necessary for proper golf course management.

"In developing these posters to communicate to golfers, we picked three of the most important, but least understood, aspects of golf course maintenance," said Randy Nichols, CGCS, president of the GCSAA. "Effective communication with golfers is extremely vital to the success of a superintendent's operation. This poster series will be an important tool in achieving that success."

Each poster includes an explanation of the topic, and is UV coated so that the superintendent may write in a specific schedule or other information, and wipe it off for reuse. GCSAA's new poster series was designed for use in the pro shop and-or locker room.

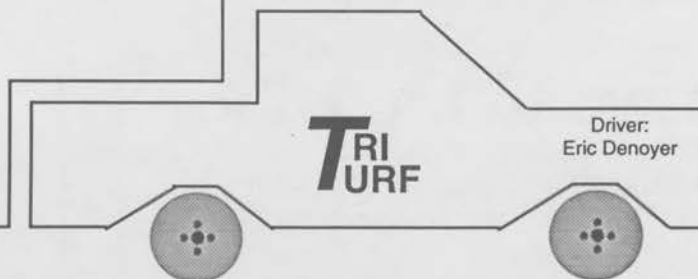
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Dowsing - An Ancient Art in Modern Use...

Continued from page two

periodicals ads for pipe locaters. These locaters, though not advertised as such, are divining rods. So an instrument could be purchased, but very simple rods that work very well can be made from materials around the shop. One type is a welding rod, stripped of its flux and bent at a right angle about 2/3 of the way down its length. Though this is my preference due to its durability, physical make-up of the rod can vary. Ordinary coat hanger wire, electrical wire, and plastic tubing bent this way also work. You will want to experiment and find your own favorites. The short end is then held lightly between the thumb and forefinger with the longer end pointed straight ahead. This method can be done one-handed with a single rod or by using two rods, one in each hand. When the dowser is over the target the rod(s) will turn either inward or outward, depending on the person dowsing. If getting the grip required is a problem or if you're accused of turning the rod intentionally, place the short end of the rod in a piece of tubing and try again. If you don't get a reading on the first try keep at it. Experiment with different target materials; PVC pipe, steel pipe, or irrigation wire. Having water in the pipe or current in the wire is no prerequisite. You can use known sites of buried material or just lie short pieces on the ground.

When you do start to get readings a couple of things will be noticeable. First, it's spooky. The rod does turn seemingly of its own volition for no noticeable reason. Once again, an understanding of why or a faith in any special power are not

necessary. The rod will begin to turn before you are right over the target and in the case of pipes and wires it will wish to turn along the running length of such a target. Very exact locations can be determined by crossing the length of such targets on the perpendicular. The rod will turn 90 degrees to your body (either inward or outward) when the rod is directly over the target and actually turn past the right angle after you cross it. The strength of the turn can vary from slight to strong enough to cause heat and friction on your fingers if you try to stop it.

With experience some conclusions as to size and depth of the target can be estimated by the strength of movement. Larger and/or more shallow targets cause a greater pull. Even more useful is that by making several passes at different places and angles, location and direction of run can be determined with surprising accuracy.

The real "art" of dowsing is not in learning to get readings from your divining rod, but interpreting what those readings are. Along with pipes, drains, wires and valves the rod will read tree roots, underground water and many other undesired objects that may be buried for whatever reasons. A general foreknowledge of the area to be dowsed is a great help. The use the divining rod to determine more exact locations and directions to reduce the search time and labor necessary in uncovering your target.

The value of more modern wire finders and locaters is indisputable, but the simplicity, speed and accuracy of dowsing definitely earns it a place in modern turf maintenance.



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Minimizing Damage from Petroleum Spills on Turf

by John R. Hall III, Extension Agronomist, Turf

Equipment-related petroleum spills on professionally managed turf are not a common problem; however, anyone making a living managing turf will be faced with this problem at one time or another. Being able to react quickly and prescribe the right remedy is important.

Very little research has been conducted on how to best reduce the injury from petroleum spills. Drs. D. Johns and J.B. Beard conducted research on bermudagrass in 1977 to evaluate potential corrective treatments for their effectiveness in minimizing turfgrass damage and enhancing recovery. Consideration of that research might provide a better understanding of how to deal with petroleum spills.

This study was conducted on "Tifgreen" bermudagrass maintained at a one inch mowing height and receiving 1 lb of nitrogen per 1000 square feet per month during the growing season. The materials and rates of application were: brake fluid, gasoline, hydraulic fluid and motor oil (305 AE) at 4.2 gallons per square yard (.46 gal/sq. ft.) and grease at 1.1 lb per square yard (.12 lb/sq. ft.). Check plots received only water drenching. Corrective treatments tested were applied within 20 minutes of the petroleum application. Corrective treatments and rates applied are noted in Table 1.

Table 1
Corrective treatments and rates applied to petroleum spills

Treatment	Application Rate (Lbs per sq. yd.)
Activated Charcoal	0.12
Calcined clay fines (2 mm)	0.40
Detergent (anionic and nonionic granular)	1.20
Water	Saturated

Calcined clay fines were poured onto the spill areas, spread evenly over the surface and drenched with water. The activated charcoal was mixed with approximately 1/2 gallon of water and poured evenly over the plot area which was then thoroughly drenched. The detergent granules were spread evenly over the plot and then drenched to form suds which were washed off the plot area with water.

The ability to determine the type of petroleum that has spilled can be helpful in prescribing the corrective action as well as assisting in finding the source of the leak. The types of injury varied with the petroleum source (Table 2).

Table 2
Description of injury to bermudagrass turf from various petroleum sources and the best corrective treatment

PETROLEUM SOURCE

Brake Fluid -

Description of Injury - Shiny leaves with wet appearance plus distinctive brake fluid odor. Leaves begin to darken and dry in 30 minutes with longitudinal leaf rolling evident. Pale-gray green color after 16 hours, distinct light-yellow color after 48 hours.

Best Corrective Treatment - Brake fluid was water soluble. Water drenched areas recovered in 4 weeks. Using deter-

gent speeded recovery to 3 weeks.

Gasoline -

Description of Injury - Shiny leaves with slightly oily appearance. Pungent gasoline odor. Turf rapidly drying within 30 minutes and developing dark color with longitudinal leaf rolling. Turf completely brown after 16 hours and turned to yellow-yellowish brown after 40 hours.

Best Corrective Treatment - No treatment was better than simply water drenching. Four weeks were required for recovery with all treatments.

Grease -

Description of Injury - Layer of grease normally visible. *Best Corrective Treatment* - No treatment was effective. All required 10 weeks to recover.

Hydraulic Fluid -

Description of Injury - Turf appears shiny and water-soaked, but dries rapidly. Turf darkens within 30 minutes and leaf blades roll. Dark brown coloration develops after 16 hours. Some shoots remain green.

Best Corrective Treatment - Detergent was effective (90% recovery in 4 weeks). Charcoal and calcined clay were ineffective (50% recovery in 8 weeks). It is necessary to...
Continued on next page

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Minimizing Damage from Petroleum Spills on Turf. . .

Continued from previous page

sary to remove the suds from the area with a squeegee, power vacuum or shovels if detergent is used as the suds contain the phytotoxic hydraulic fluid.

Motor Oil -

Description of Injury - Turf shiny with distinct oily appearance. No visible change occurred in the first hour. Turf remained shiny after 16 hours with a small amount of leaf rolling. Leaf browning became evident after 20 hours. Shiny oily appearance remained 48 hours after the spill.

Best Corrective Treatment - Detergent most effective with 85% recovery within 4 weeks. Turf treated with activated charcoal or calcined clay only achieved 30% recovery after 8 weeks. Removal of suds is important as noted with hydraulic fluid.

In summary, detergent treatment applying 1.2 lbs of detergent per square yard increased the speed of recovery of turf by 3 to six weeks when compared with calcined clay and activated charcoal. When using detergent it is important to do so quickly, confine the suds to the spill area as much as possible and remove the suds from the site.

It is worthwhile to treat petroleum spills even if the shoots are severely damaged, because the phytotoxic residue can further damage growing points in the crown area.

Credit: Tee to Green

Anthracnose

Karl Danneberger, PhD, Research Agronomist,
Ohio State University.

Anthracnose is a warm weather disease that can cause serious damage to annual bluegrass greens and fairways. Recently this disease has also been found on creeping bentgrass in isolated instances. Disease symptoms appear as irregular patches of yellow-bronze turf ranging in size from a few inches to several feet. Leaf lesions initially appear as elongated reddish-brown spots.

Anthracnose is caused by the pathogen *Colletotrichum graminicola*. This fungus infects the plant via spores that are small, curved and hyaline (transparent). In the presence of water, these spores germinate, producing an appressoria which allows the fungus to penetrate the leaf epidermis. The fungus then proceeds to grow and develop, culminating in the formation of a fruiting structure called an acervulus (plural spelling is acervuli). A characteristic of acervuli is the presence of spiny structures called setae. The diagnostic key for this pathogen is the observation of the acervuli.

Disease occurrence is most severe when night time temperatures are warm, moisture is present (ie. rainy period) which is followed by warm drier weather. Anthracnose has also been reported to occur under cool temperatures during the spring. The fungus that causes warm weather anthracnose also causes the cold weather anthracnose. Symptoms are the same but one difference between the two is the location of the acervuli. With warm weather anthracnose the acervuli appear on the leaf blade while on cool weather anthracnose the acervuli form in or around the crown region.

It may appear that this disease has no pattern - occurring in both cool and warm weather - but the one common thread is that the turf plants are under the same sort of stress. *Colletotrichum graminicola* is very effective at killing annual bluegrass if it is under an environmental stress.

No cultural practices exist that will completely control anthracnose. Moderate nitrogen applications (1/2 lb/1000 sq. ft.) monthly during June, July and August, however, have proven effective for reducing the amount of disease.

Fungicide applications are effective for controlling anthracnose. The sterol inhibiting (Bayleton, Banner and Rubigan) and the benzimidazole (Tersan 1991, Fungo 50 and Cleary's 3336) fungicides have performed very well. Daconil 2787 has been effective only through preventative applications. I have found that the first fungicide application is the most critical. If the application can be made at or just before the first infection, this pathogen can be easily controlled. If damage occurs, control through curative treatments is more difficult.

In using fungicides for controlling *Colletotrichum graminicola*, especially with the benzimidazoles, thought should be given to how best use them. As previously mentioned, the benzimidazoles are effective, but we have found resistance in the field to these fungicides after repeated use.* Alternating or mixing the benzimidazoles with a fungicide with a different mode of action would be advisable.

*W.W. Shane and T.K. Danneberger, 1989. Plant Disease 73:775

Credit: Tee to Green

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Guidelines for Controlling Moss in Greens

by Norman Hummel, Cornell University

The quality of golf course greens by present day standards is often determined by green speed. Golf Course superintendents are mowing greens shorter and keeping the nitrogen fertility lower than ever before to obtain faster speeds. A consequence of these practices has been a reduction in turfgrass vigor to a point whereby the greens are much more prone to weed encroachment. One of the more troublesome weeds to have become a problem is moss.

Until recently, the only known means of controlling moss was through the use of mercury products. With the support of the Metropolitan Golf Association, research was conducted to look at means of controlling this serious weed. This research identified both chemical and cultural tools that could be used in a moss eradicating program.

CHEMICAL CONTROL

Pesticides and other materials offer hope in controlling moss on bentgrass greens. In the early spring, moss commences its growth much earlier than bentgrass, giving it an early competitive advantage. Hydrated lime applied in late March at 3 to 5 lbs. per 1000 square feet will burn back the moss during this period. The lime can be spread easily if mixed with a dry sand topdressing.

An effective treatment for moss control would be the Scotts Goosegrass Control; a betasan-ronstar combination. Labeled for use on bentgrass greens, this product provided 83% control from only a single application. While this product will cause some discoloration, it appears to be one of the more promising moss control products.

Siduron (Tupersan) and bentazon (Basagran) provided from 53 to 74% control of moss. While they were not quite as effective as the Scotts product, both siduron and bentazon were much safer since no injury occurred for either product.

You should note that with the exception of bentazon the most effective treatments are pre-emergence herbicides. While it can't be determined from these trials whether the effect is pre- or post-emergent, it should be mentioned that the herbicidal activity of these materials on moss was chronic. It was several weeks before we noticed any significant decrease in moss populations.

CULTURAL CONTROL

Chemicals offer only a partial solution to the moss problem. Unless cultural steps are taken to increase turfgrass vigor, chemical control of moss will be an ongoing battle. We designed studies to look at the effects of cultivation techniques and fertility on moss eradication. The results clearly demonstrated that culture can be changed to the detriment of moss.

While silvery thread moss will tolerate dry conditions, it is favored by an abundance of free water. Core cultivation immediately followed by sand topdressing would create a system of "vertical drains" that would facilitate a rapid water removal of the surface. We found that moss removal was hastened where this practice was followed compared to core cultivation alone.

Nitrogen and iron are the most important tools in a moss eradication program. Moss control improved as the rate of nitrogen was increased. Moss was eliminated over two growing seasons from plots that were initially 40% moss by increasing nitrogen rates to about 0.8 lbs. per

1000 square feet per growing month (6 lbs. N/year). Iron applications at a rate of 6 ounces per 1000 sq. ft. per month were beneficial the first year, especially at the higher rates of nitrogen. Iron had no effect on moss in the second year.

While we didn't measure green speed, these high nitrogen treatments undoubtedly resulted in slower speeds. The bottom line though, if you have moss, is that you are going to at least temporarily have to increase nitrogen rates. Effects on greens' speeds can be minimized by careful control of water, double cutting, or increasing potassium levels.

Moss control research has until now looked at fertility and herbicides independently. Studies are being conducted to look at combinations and nitrogen fertility in moss eradication programs. Perhaps this research will identify more reasonable nitrogen rates to use in conjunction with a herbicide program to eliminate moss from greens.

In summary, enough information is known for a superintendent to develop a legal moss control program. Early spring applications of hydrated lime, followed about a month later and in the early fall with a herbicide are the first steps in controlling moss. Increasing your nitrogen levels during this period will no doubt improve the competitive advantage of desirable grasses at the expense of moss. Furthermore, control your soil moisture levels through careful irrigation and by providing good drainage throughout the soil profile.

Credit: Our Collaborator, Northeastern GCSA, Sep. 1990

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Are You All Wet?

By Bill Rhymes, Mallinckrodt, Inc., Shelby, NC

Imagine if you will the mouth of the mighty Mississippi River as it empties into the Gulf of Mexico. While there is a main channel where most of the shipping moves, the river has broken up into many channels, all emptying into the Gulf. There is much marsh land and even completely dry land between these channels of water. Now imagine a golf green with rain and irrigation water falling on it. This water also channels down through the soil. There are wet areas, damp areas and completely dry areas.

When a soil or other growing media wets slowly or non-uniformly, it is due to the physical properties of the soil as well as the water. Hydrophobic organic components of soil and a preponderance of capillary pore space combine to restrict the rate of water movement into such soils. Water's high surface tension, due to strong cohesive forces, restricts movement into capillary pore space. The same physical forces that delay water movement into hydrophobic growing media or cause localized dry spots in turf also restrict or delay water movement out of wet spots, assuming the excess water has someplace to go.

The solution to both dry spots and wet spots is to **increase the rate of water movement** by providing a link between hydrophobic soil (or media) and hydrophilic water. Surface-active agents (surfactants) sold as wetting agents should do several things: 1) decrease water's surface tension; 2) facilitate water movement into dry soils; 3) remain absorbed onto the soil colloids after drying to effect re-wetting; 4) facilitate drainage from areas prone to stay

wet; and 5) have a wide safety margin on plant material.

Perhaps no other type of product used in turf and ornamental industries causes as much confusion and misunderstanding as surfactants. Such names as detergent, dispersant, wetting or re-wetting agent, penetrant, cleaner, spreading agent and emulsifier most often describe the action or result desired and are, as such, not descriptive when distinguishing between one and another. For instance, a detergent is also an effective wetting agent.

Rather than labor these names, it is sufficient for the professional turf and ornamental manager to recognize those products developed for wetting soil/artificial growth media. Have you attended any major turf or ornamental trade show recently? If so, you probably saw or were told about several wetting agents and why a particular one was "best on the market." Should you use one, and if so, which one and why? Here are some guidelines:

1. Don't buy water. Many products have very little active ingredients in them (some as low as 5%) and the rest is water. Initial cost per gallon is low, but they may not last but a few days in the soil.
2. Buy one that is all-wetting agent, i.e., 100% active ingredient. These are by far the most economical as only one or two applications are needed per growing season.
3. Buy one that has a history of success and consistently ranks at the top in university & experiment station tests.
4. Talk to other superintendents and growers. Many are

Continued on next page

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Are You All Wet. . . .

Continued from previous page

using these good products and they'll be glad to tell you their product of choice and why they use it.

5. When using soil wetting agents, they must be **well watered in** (using a liquid type) or uniformly mixed with the soil (using a granular type). Left on the surface, they can be phytotoxic.

Here are some benefits to you for using a good soil-wetting agent:

1. TURF

- a. Dew elimination for several days following application may aid in disease control.
- b. Fewer dry spots, fewer wet spots.
- c. Less hand watering to correct for dry spots, giving conservation of water and manpower.
- d. Soils able to absorb moisture more rapidly during heavy precipitation.
- e. Less severe on treated fairways, greens, etc. – wilting less severe.
- f. Encourages stronger, healthier turf by helping water soak into and spread more evenly through the soil.

Minor Details

Donald A. Cross, CGCS, Skokie Country Club

There is probably little, if any, of the following that you haven't already heard, seen, or done. It concerns the topic of paying attention to minor details. This probably serves the purpose of reminding me about these things as much as it does for any of you.

Now that we are into the normally high plant stress period, the tendency to get psychologically and physically drained is heightened. We all can begin to get a little tired and occasionally lose sight of some of the things we often routinely perform, the seemingly insignificant, but extremely important, minor details.

One of the most noticeable minor details that comes to mind are tee and green supplies. Clean balls with soap and water, and clean towels should be standard operating procedure. Daily cleaning of the putting cups and painting of aluminum or replacing of plastic cups when necessary, and keeping flags and flagsticks in good condition, also go a long way towards projecting your concern for details.

How about your tee surfaces? Are broken tees and debris removed, divots replaced or removed and refilled with top-dressing and seed, and divot mix buckets kept filled? Have the yardage markers and sprinkler heads been edged recently? This can apply to fairways as well and include valve boxes and drainage grates. Additional edging would obviously include bunkers and flower beds.

How about traffic control supplies? I dislike ropes and signs but sometimes there's no alternative. The least we can do is make sure the signs are neat, stakes are set straight and

2. ORNAMENTALS

- a. Prevents plant loss under dry or wet weather conditions.
- b. Treated soils wet rapidly – less runoff.
- c. Wets and drains the root zone uniformly.

Lastly, we generally think of the major benefit of using a wetting agent as better use of available water. This does happen. However, of equal or perhaps greater benefit is that other chemical soil additives are uniformly distributed for maximum efficiency. Remember the opening paragraph about the Mississippi River and the dry areas between the channels? Our wetting agent has done away with these dry areas in our soils. therefore, our fertilizer, soil fungicides, soil insecticides, soil herbicides, etc., are spread out evenly, and the plant root system gets a uniform "dose" of not only water but these expensive chemicals as well.

Wetting agents don't cost you money! They make money for you. Your turf and plants have responded better to all soil additives; hence, they are healthier. You have done a better job, in less time, and have saved money and manpower in many ways. You are more secure as a professional. You find you are not "all wet", just "wet enough".

Credit: Carolinas Newsletter, July-Aug. 1985

trees are not used for securing ropes. This is certainly a minor detail but you can be sure players notice.

How do your trees and ornamental plant materials look? Pruning of dead, damaged and low hanging branches and removing suckers, broken stems, spent blooms, and the all too occasional wedged-in plastic cup or crushed beer can, will show your concern for more than just turfgrass.

How does your equipment measure up? Our members and boards spend significant sums of money on equipment and surely expect it to be maintained well and kept clean and orderly. We often have to use some rather antiquated equipment but this is no excuse not to take care of it and besides, it's easier to sell them on an additional piece if they know it will be treated properly.

Finally, how do you and your employees look? Our employees' appearance, as well as our own, can have a major impact on how we are perceived by the people we work for. Stand back and take a look. Are their uniforms or clothes neat and clean, is their personal hygiene appropriate? Remember when you start to point your finger, look in the mirror and try it first.

As I stated before, these items are not in any way profound or untrodden, but merely some thoughts to keep us focused during perhaps the most difficult time of the year. We could all add numerous items to this list.

Just some minor details, but don't forget, several minor details can add up to major success.

Credit: BullSheet

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.

July Plantings for the Fall Garden

by James A. Fizzell, Sr. Ext. Advisor, Horticulture, U of I

Many vegetables may be grown for the fall garden with great success. For those with limited space it is a must.

Any time after July 1, sow carrots, radishes, turnips, Chinese cabbage, and kohlrabi seeds. Chinese cabbage tends to grow better as a fall crop than as a spring crop. Harvest when it is three to four inches tall for salad greens or allow to form heads.

Radishes are favorites of many gardeners, since they grow so quickly. Icicle, Champion and Red Prince varieties work quite well. These are ready to harvest in less than 30 days.

Turnips should have an equal part in the fall garden. Sow seeds in rows for ease when weeding. Mix seeds with coffee grounds to help eliminate clusters of seeds when sowing.

Carrots are the all time favorites of fall gardeners. Scarlet Nantes, Royal Chantenay and Danvers Half Long are a few suggested varieties. Carrots are slow to germinate in hot weather, so mix carrot and radish seeds together. The radishes will germinate first, breaking the soil and showing the row. Remove the radishes as they mature, thereby leaving room for the carrots to grow.

Other crops that do well in fall gardens are spinach, beets, swiss chard, leaf lettuce, mustard, and beans. To have success with your garden, follow these easy steps. Sow seeds at 1 1/2 to 2 times the recommended depth. Cover with a light mulch to keep the soil cool and prevent crusting. Keep adequate and constant moisture. Establish a regular watering, feeding and spraying program.

Credit: BullSheet

Are your needs as a Superintendent supported by your board/owner/manager?

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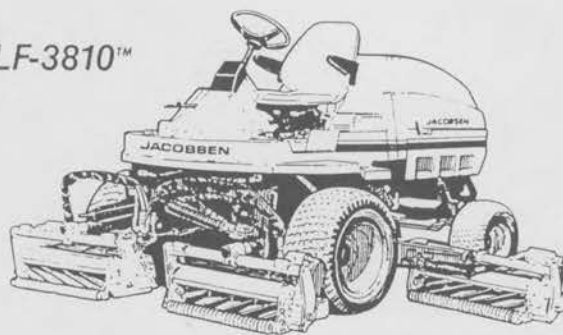
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Winter Injury Update

by Dr. John Roberts

My past two winters spent exploring the causes of crown hydration have uncovered some interesting results. Here are a few of the key findings.

1. **TRANSITION PERIOD IS THE MOST CRITICAL:** During the 2 to 3 week snowmelt period in early spring, standing water and saturated crown tissues often exist on semi-frozen soil surfaces. Wide and rapidly changing freezing and thawing temperatures also occur during this period. In addition, the turf is physiologically in a weak condition and the young new tissues being produced are extremely more vulnerable than tissues found in dormant turf during the mid-winter. This is not to imply that turf cannot be killed during the months of December through February. It can. However, the environmental conditions (temperature fluctuations) to damage turf need to be more severe.

2. **POA IS THE MOST SENSITIVE SPECIES:** This should come as little surprise to many that have witnessed just the loss of Poa in greens equally mixed with bents. Between the various bentgrasses, the velvet and creeping types were the most tolerant. The colonial bent was intermediate (yet considerably more resistant than the Poa).

3. **FALL POTASSIUM IMPROVED TOLERANCE:** During the hardening period of late fall, samples fertilized with a high potassium diet (having a 1:2 nitrogen to potassium ratio) had 30% less damage than samples not receiving potas-

sium. The least tolerant samples were those fertilized with nitrogen only (urea at 0.75 lbs.) during this critical hardening period (30 to 40 days before dormancy. Avoiding practices that promote active growth during the hardening period help prepare turf for the demanding winter months ahead.

4. **RAPID TEMPERATURE CHANGES ARE MORE DAMAGING:** Warm days and quickly freezing temperature changes at night result in greater damage than gradual fluctuating temperatures. When subjected to rapid reductions in temperatures under controlled freezer conditions 40 percent more injury occurred than to samples under field conditions. A snow cover during the transition period serves as an insulator and helps preserve the turf. The critical days follow the melt period (with or without early snow clearing) when the exposed and saturated soil surfaces are at the mercy of Mother Nature.

5. **PREDICTING LETHAL TEMPERATURES DIFFICULT:** Due to its diversity and overall complexity, forecasting the environmental conditions that result in damage will likely never be an exact science. However, guidelines can be established and improved as testing continue. In the trials at UNH, for example, the lethal soil temperatures to kill 50% or more of the Poa population in the transition period was 20 degrees F. and 10 degrees for the bents. To obtain this

Continued on next page

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Winter Injury Update. . . .

Continued from previous page

degree of damage the turf was subjected to 3 repeated freeze-thaw cycles with rapidly changing temperatures.

PREVENTION POSSIBLE?

A better understanding, innovative ideas, new technology, genetic improvements and even small miracles might be necessary to help eliminate this problem. This project has moved us closer. However, the ultimate fate of the turf still appears largely dependent on Mother Nature. Today's best management practices help provide protection during most winters. These practices should include:

Suggestions on Green Speed

by Jim Connolly, USGA Green Section

One of the best statements on green speed can be found in the 1973 Manual for Championship Preparation by the USGA: "The greens should not be cut or rolled to the point where a ball could gain speed in putting down all but the severest slopes."

Furthermore, "A player should be able to stop the ball at the hole."

The ball should come to rest within 2 to 3 feet of the hole when putting from above the hole. There may be rare occasions where this may not be the case, perhaps on a green where the obvious strategy would be to keep the ball below the hole, and only a miss-hit shot would end up above the hole.

These guidelines should be followed when setting cutting height and green speed. The speed should be set up to represent the average of all 18 holes. If there is only 1 severely sloped green, the speed should not be set to this green. However, 5 or more greens with slopes and undulations would have a definite impact on overall cutting height/green speed.

I recently visited a golf course built in 1921 that has an average green size of less than 5000 sq. ft. and more than 9 of the greens could be considered "undulating". Many areas of the greens are not used for hole locations when cutting heights go below 5/32". When greens are cut so short that flagstick locations are lost you are essentially robbing the golfer of a good part of the game. This is a shame.

"Large, flat expansive greens are most prone to lower cutting heights because of their design. Many golfers that complain about slow greens, especially on large greens, lack a quality in their game called **authority of stroke**. John Jacobs, famous British instructor and former Walker Cup coach, describes this fault in golfers; "We tend to coax it, steer it, drag it, jab it, twitch it - anything but hit it!" *John Jacobs, Practical Golf.*

On this type of green, the emphasis should be upon *smoothness* because the distance of the ball travel may be longer. Imperfections along the lines of the putt will make it difficult to predict ball direction and roll.

Enter this season with these thoughts in mind and begin to manage the putting surfaces appropriately. Go out on the course with the green committee and go through the above steps. Examine each green and see if there are hole loca-

1. Maximizing the bentgrass populations. This is especially critical in the low wet portions of the greens which are most likely to be damaged by crown hydration damage
2. Maintaining high potassium levels entering the winter.
3. Avoiding cultural practices which stimulate growth during the hardening period of late fall.
4. Designing new greens which allow for rapid surface run-off.
5. Constructing greens with permeable soils and installing drain lines for rapid sub-surface drainage.

Credit: New Hampshire Turf Talk

tions that have been sacrificed to the speed god. Get them back.

The Green Superintendent greatly influences the game as a direct result of maintenance. He/she is responsible for preparing the course and making decisions that are best for the game.

The USGA Green Section Turf Advisory Service (TAS) is designed to assist golf courses in maintenance programs that bring out the best in a golf course. A visit to your course opens a forum for discussion and creates an atmosphere of open communication. I encourage you to support the USGA Green Section by subscribing to TAS this year.

Credit: New Hampshire Turf Talk

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**Research Advisory Committee
Convenes at GCSAA HQ**

A panel of golf course superintendents, golf industry officials and university researchers met recently at the headquarters of the Golf Course Superintendents Association of America.

The committee met April 28-29, 1993, to identify and prioritize key research projects for GCSAA's Scholarship and Research (S&R) foundation to undertake over the next five to ten years.

Some of the projects the committee listed as priorities for GCSAA S&R included: a national study of the economic impact of golf courses and golf course maintenance, bird and wildlife studies that would document the impact of golf course maintenance practices on animals, risk assessment studies that would document the actual pesticide exposure workers and golfers could encounter on golf courses, and water usage studies that would document actual water usage rates on golf courses around the country and compare them to other agricultural and industrial uses.

GCSAA Director Paul S. McGinnis, CGCS, chairman of GCSAA S&R, and GCSAA Director George E. Renault III, CGCS, vice chairman, represented the association's board of directors on the committee.

Other participants on the advisory committee included Dr. John Cisar, James T. Snow, David Stone, Mike Waldron, Dr. Dave Wehner, and Dr. Gail Schumann. Robert D. Ochs, GCSAA Senior Director of Communications chaired the committee.



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Ways to Improve GCSAA

Charles H. Cross, Jr., President, Long Island GCSA

1. Hire a new executive director who is well-versed in the game of golf and knowledgeable about the science of golf course management.
2. Dismiss Robert Ochs.
3. Relocate our national headquarters to Florida.
4. Own one, two, or maybe three golf courses for
 - a. a source of revenue.
 - b. a place for vacationing or retired GCSAA members to play golf.
 - c. a place to conduct turf research that would enable us to become better golf course superintendents.
 - d. a place to host our annual golf tournament.Look at what a good headquarters the golf professionals have in Palm Beach Gardens, Florida. Why not us?
5. While in Florida develop a four year Bachelor of Science program in Golf Course Management with a nearby university.
6. Develop a "Human Resource Center" within GCSAA (Issues and a thought II, Hole Nine Yards, Vol. 6, No. 3, written by Jim Gilligan, CGCS). The Human Resource Center could:
 - a. communicate between golf course superintendents and their employers.
 - b. mediate differences between golf course superintendents and their employers.
 - c. support golf course superintendents who may be in hazardous situations.
 - d. educate golf course superintendents how to keep their competitive edge as they grow older.
 - e. educate golf course superintendents on how to interview for jobs, write resumes and obtain employment contracts that work for them.
7. Don't expand the membership classes. Our GCSAA should be focused on the golf course superintendents and their needs. Having a class for assistant superintendents is fine. Having a class for commercial people is necessary. The majority of them are an extremely important facet of our business and should not be forgotten or abused. Remember, it's the Golf Course Superintendent's Association of America. All of the efforts of the GCSAA should be geared towards the golf course superintendent and nowhere else. GCSAA should never become a golf course employee's association.
8. Improve and strengthen the relationship between GCSAA and its affiliated chapters. Some ideas are:
 - a. Urge all chapters to fund local and regional scholarship and research ventures. Everyone gains from this approach.
 - b. Have chapter liaisons communicate on a regular basis and have an annual forum at our national conference to discuss important happenings from across the country.
 - c. Have chapters that excel with their educational pro-

grams recognized in *Golf Course Management* magazine and recognized at the annual conference and show.

9. Improve *Golf Course Management* magazine. Encourage letters to the editor. Encourage people to express their views. Encourage golf course superintendents to write stories or articles to appear in *Golf Course Management*. As an incentive, have cash prizes (\$5,000, \$2,500, \$1,000) that could only be used for investment in a scholarship fund for their children.

The way the recent Dinah Shore article was interrupted with ads (I know, ads pay the bills) was disgraceful. She is the recipient of our top award. Don't compromise the article with ads!

10. For our Class A members who come from remote areas with small budgets, I feel that they should be given a break in dues and educational materials. Let them decide what they can honestly afford. It's worth a try. Chapters could be a big asset in reaching out to this section of members.

These are some thoughts of mine and of some other people. I believe they deserve consideration. GCSAA should be an organization geared towards the golf course superintendent and the superintendent only!

Credit: *Hole Nine Yards*, April 1993

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Caloclor and Calogran to be discontinued

It's 87° out and I'm thinking about snow mold. Every year rumors spread and we are warned that caloclor and calogran are going to be taken off the market and we will have to find a substitute. It has been brought to my attention that this is now true. The manufacturer is **voluntarily** withdrawing their mercury products with the EPA as of July 1, 1993.

Due to increased pressure on the only mercury compound remaining in use in the U.S., the manufacturer can no longer support the registration process of a mercury compound.

How does this affect our industry? The manufacturer requested the following withdrawal procedures with the EPA:

1. The products will stop being produced in the U.S. immediately.
2. Materials can be purchased through December 31, 1995.
3. Golf Course Superintendents will be allowed to use their inventories of caloclor and calogran until their inventories are depleted.

The manufacturer is waiting to hear back from the EPA and will inform the industry as soon as they know anything.

So with that, I'm going to pour myself a lemonade and turn on the fan.

Kimberly Olson

Job Description

The Assistant Golf Course Superintendent is a position that is crucial to any well-managed golf course. The Assistant is the main link between the Superintendent and the golf course. The responsibilities of a Superintendent seem to grow every year due to an increase in new employee labor and safety laws, new pesticide regulations, dealing with regulatory agencies, larger budgets, etc. With these increasing administrative duties, this leaves your Assistant with more responsibility to monitor daily course conditions and the communication of on course crew supervising.

As a Superintendent, do you have a written job description with the responsibilities outlined for your assistant? This is the person you need to take on a few more of your past responsibilities.

Mike (Morris, Golf Course Superintendent, Crystal Downs Country Club) and I both feel that the main responsibility of an Assistant is to monitor all aspects of course condition daily. This does not mean that they must water every dry spot, trim every tree and fill every ball washer, etc. as they make their way across the golf course each day. They should make note of their daily observations and report their observations or a plan of action to the superintendent.

Like any manager's position, communication is the key to being successful. Most days the Assistant spends more time

on the golf course than the Superintendent.

Here is a list of my responsibilities at Crystal Downs: monitoring all daily course operations; assist in managing a staff of 14; monitor course playability; monitoring consistency and green speed; check daily irrigation needs; set up schedules and programming; perform irrigation repair and pump maintenance; locate and identify any diseases, insects and turf related problems; assist spray technician during pesticide applications; monitor daily equipment performance; oversee course set up; monitor and order irrigation parts, employee supplies, golf course supplies; perform record keeping; organize employee work schedules; and most of all, communicate all of my work and observations to Mike.

All of my responsibilities are under the direction of the Superintendent.

My responsibilities do not include hiring, firing, reporting to committees and members, implementing policies and practices.

In closing, I hope the examples I gave you from my job description at Crystal Downs will help your management team's communication and make your golf course even more successful.

*Steve Hammon, Assistant Superintendent,
Crystal Downs Country Club*

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Notice: Detroit Ball Bearing Maintenance Seminar Sept. 30 in Traverse City. Call 1-800-598-7075 for information and registration.

Dealing with Difficult Situations

Michael Morris, Superintendent, Crystal Downs C.C.

The situation is this: the golf course has suffered severe winter damage with acres of dead *Poa annua* on the fairways, and damage severe enough on the greens that resodding or rebuilding are the only real options for play in the upcoming season.

On top of this situation, "help" starts pouring in from club patrons and peers. Things like. . . "It's never been this bad before on our course;" "It must have been something he sprayed;" "He must not have sprayed for it;" "Mike sure lost a lot of grass;" and "We've never had this problem before. . ." Then to top it off the "expert help" starts coming in from other turf professionals: "I sprayed so I don't have that problem;" "I'll bet his job is on the line;" and the clincher, "His maintenance practices have changed the percolation rate of the soil." What is the percolation rate of frozen ground? Huh?

This scenario is played out regularly in our profession whether the problem is winter damage, summer disease, mechanical problems, or even policy problems within the administration or management. The nature of our business is to deal with the contingencies that occur regularly in the environment, in business, and with people. A big part of our job is dealing with difficult situations, and if the situations aren't enough of a challenge, there is always a group on the sidelines ready to share their opinions or make the problems more complex.

The first step in dealing with a problem like this is to assess the situation objectively. What have I done to head this off, what may I have done to bring this on, and what might I do to correct this situation in the future? Once you have fully assessed the situation objectively and honestly, be prepared to offer your honest assessment to your superiors along with a plan for correcting the problem. At this point you have done all you can do, except for implementing the plan of action you feel is necessary. Your superiors will decide whether or not to believe you or follow your recommendations: then you move ahead accordingly.

Remember also that there are people out there who will offer you real help. Oddly, these are not the people offering the suggestions and comments I outlined above. Rather there are researchers and support teams from our industry and other associations like the USGA who will have information you can use as you communicate with your superiors and prepare your plan of action. This step takes some effort on your part, but the feedback and information you will get is well worth the asking.

Lastly, don't waste time and energy trying to clear the smoke screen of rumors and idle talk coming from the sidelines. This will only add to the frustration of an existing problem and take energy away from your efforts to improve the situation.

I wish I had a dollar for each time I explained crown hydration winter kill to members of our club and people in our community. That would be quite a bonus for dealing with that particular challenging problem, and putting up with all the headaches of a challenging spring. But after all, I have to say that dealing with problems is a big part of the job I'm already being paid to do.

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By Monroe S. Miller, *The Grass Roots*

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These low technology machines haven't changed substantially in 25 years. No reason to, really. They are durable, easy to repair on those rare occasions when they need fixing, and can climb the old and steep surrounds of a golf course built many years ago.

Except for one thing. They are now powered by Japanese engines.

I almost didn't accept delivery of the first two I'd purchased that came with the foreign engines - no one had told me they were standard. Had I known, I likely would have specified a Briggs and Stratton engine, just like those that the other three had.

Good thing I didn't know. It is very difficult for me to confess that these small Japanese engines put any similarly-sized American engines to shame. They made these little National triplexes seem as though they had undergone a complete redesign.

Sad to say, the foreign engines are quiet, smooth (absolutely no vibrations), fuel-efficient and trouble-free. They always start. I was amazed and impressed.

And depressed. "Why can't we make products like that anymore?" I wondered to myself more than a few times. Wisconsin was the home for the world's small engines for decades - Briggs & Stratton, Kohler and Tecumseh. I

know these manufacturers are capable of giving us such a product. Why don't we see it?

That is all background information that helps explain why I am so revved up about a new \$1 million engineering effort at the University of Wisconsin-Madison. The program is aimed at helping small engine makers meet tougher federal pollution laws while protecting 90,000 jobs statewide.

The research effort is called "The Wisconsin small engine consortium" and is being supported by Briggs & Stratton, Kohler, Tecumseh, OMC, Mercury Marine, Nelson Industries and Harley-Davidson.

Concern about meeting air quality standards that are to be phased in by the year 2000 stimulated formation of the group.

Small engines are currently unregulated for their emissions, and there is a big question as to how the manufacturers will meet the new standards. Of equal concern are the potential increased costs.

The research will focus on the unburned hydrocarbons given off by the small engines we use on so much of our golf course equipment. Obviously, that implies a lot of carburetor research.

The 90,000 jobs number should be clarified. Something over 17,000 people are employed by the consortium directly; 72,000 state residents work for companies that supply the consortium with parts, materials and services. Big bucks are involved here. The engine makers generate annual sales of more than \$4 billion!

Of the \$1 million to be spent, the state will provide \$470,000 and the balance will come from the companies.

The money will be used for materials and equipment to be used in the research. As with our turf research, grad students will help also. Five or six will be working on the project at any one time.

The UW-Madison College of Engineering has been doing engine research for nearly 50 years at its Engine Research Laboratory, another example of one of the things that makes it a world class institution.

By the way, American-made small engines, just like American cars, have improved drastically in recent times so that they are among the world's best.



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1993-94 Calendar of Events

Dates Subject to Change (* NMTMA Dates to note)

DATE	EVENT	LOCATION
AUGUST		
5-8	BUICK OPEN	Warwick Hills C.C.
12-15	PGA CHAMPIONSHIP	Inverness Club
17	WISCONSIN TURFGRASS FIELD DAY	R&E Facility, Madison, WI
19	M.T.F. TURFGRASS FIELD DAY	Hancock Center, MSU
26	*N.M.T.M.A. Meeting	Gaylord C.C.
22-25	MICHIGAN PGA CHAMPIONSHIP	Garland
28-29	MICHIGAN PGA SHOW-DOWN	Garland
28-1	UPS GREAT LAKES OPEN	Boyne Highlands
SEPTEMBER		
13	W.M.G.C.S.A. / MTF FUNDRAISER	Egypt Valley C.C.
16	MICHIGAN SUPERINTENDENT'S CHAMPIONSHIP	The Fortress
20	*N.M.T.M.A. FUNDRAISER	Little Traverse Bay
28	W.M.G.C.S.A. ANNUAL MEETING	Thornapple Creek
OCTOBER		
4	*N.M.T.M.A. ANNUAL MEETING / Tuck Tate Classic	Walloon Lake C.C.
4	M.B.C.G.C.S.A. / MTF FUNDRAISER	Franklin Hills C.C.
		Katke-Cousins C.C.
		Grosse Isle C.C.
		Oakland Hills C.C.
14	G.C.S.A.A. seminar "Micro-Biology of Turfgrass Soils"	Holiday Inn - East Lansing
NOVEMBER		
6	W.M.G.C.S.A. FALL DINNER PARTY	C.C. of Jackson
16-18	G.C.S.A.A. Executive Training Seminar - <i>Developing and Maintaining Effective Employee/Management</i>	Holiday Inn - East Lansing
DECEMBER		
4	*N.M.T.M.A. / M.M.T.M.A. CHRISTMAS PARTY	Garland
JANUARY 1994		
3-5	WISCONSIN TURFGRASS & GREEN INDUSTRY EXPO	Holiday Inn W., Madison, WI
18-20	MTF 64th ANNUAL TURFGRASS CONFERENCE	Holiday Inn South
FEBRUARY 1994		
1-2	G.C.S.A.A. GOLF CHAMPIONSHIP	Austin Texas
3-7	G.C.S.A.A. ANNUAL CONFERENCE & SHOW	Dallas Texas
23-24	G.C.S.A.A. SEMINAR	Treetops



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