WESTERN MICHIGAN GOLF COURSE SUPERINTENDENTS ASSOCIATION

Official Publication of the W.M.G.C.S.A.

Western Views

MAY/JUNE 1987

PRESIDENTS MESSAGE

Kurt A. Thuemmel C.G.C.S.

April, 1987, will probably be remembered as one of the mildest and dryest Aprils that anyone can recall. A lot of golf has been played and it certainly seems like we are all off to a successful season as far as the financial statement is concerned. The weather usually balances out, and this spring is no exception, with last September being so wet and now a dry April. I wonder what May & June will be like?

The April meeting was held at Grand Haven Golf Course. If you weren't able to make it, you missed a good one. Our speaker was Jerry Matthews, who spoke on the history of Grand Haven Golf Course along with slide presentation. Thanks to Wally Matthews for his excellent cooking skills and to Steve Adamczyk for providing a well conditioned Golf Course. I know everyone joins with me in wishing a speedy recovery to Bruce Matthews, who is recuperating from surgery.

In September, a state wide tournament will be held at Forrest Akers Golf Course on the Campus of Michigan State University for Golf Course Superintendents. Bob Johnson will be helping to coordinate this "first time ever" event with the Michigan and Border Cities Golf Course Superintendents Association. I would like to encourage all Golf Course Superintendents to participate in this potentially fun-filled day, and it will offer you the opportunity to acquaint yourself with your fellow superintendents outside our Association. Further details will be provided at a later date.

May 29th is the Charter Fishing Trip out of Saugatuck with Captain Gorney organizing this one. Details will follow with the next meeting notice.

See you in May.

Kurt A. Thuemmel

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THE BLACK LAYER PROBLEM ON GREENS

by Bruce Branham, Assistant Professor
Paul Rieke, Professor
J. M. Vargas, Professor

There have been an increasing number of reports from golf courses around the State of black layer which forms below the soil surface on greens. In a worst case, those areas which develop a black layer can suffer significant turf loss. The turf research group at MSU has observed the problem on many golf courses and are beginning several research projects to determine more about the cause and cure for this problem.

At the present time, we have formed the following hypothesis on the development of the black layer. We are certain that the black layer is in an anaerobic state (no oxygen present - waterlogged) and this waterlogged condition is responsible for loss of turf. An anaerobic condition can develop whenever the ground becomes saturated with water which displaces the oxygen in the soil and prevents normal gas exchange with the atmosphere. In many greens which are constructed according to the USGA greens mix and are predominantly sand, the formation of an anaerobic condition may seem contradictory because sandy soils normally have excellent drainage. However, where layers develop in a soil profile, these layers retard downward water movement and under certain conditions anaerobic areas may form.

It is our belief that the black layer forms when a layering problem causes an anaerobic condition following heavy rains or irrigation. Under anaerobic conditions an entirely different group of microorganisms becomes active. These organisms produce products quite different from anaerobic respiration. Gasses produced under anaerobic conditions include carbon monoxide (CO), methane (Ch4), ammonia (NH3) and hydrogen sulfide (H2S). Many of these anaerobic respiration products are toxic to plants. In particular H2S is the poisonous gas responsible for the deaths of over 1,500 people in Cameroon recently. The hydrogen sulfide produced by anaerobic organisms can react with metal ions such as iron or copper to form insoluble black precipitates. These metal sulfides are probably responsible for the color of the black layer. Indeed, the Black Sea derives its name from the production of vast quantities of these black metal sulfides. The precipitated materials seem to enhance the layering problem and thus, once the black layer is formed it is very difficult to dry out.

What to Do

It is clear from our observations that once the black layer forms, it is difficult to destroy. Prevention of the formation of the black layer is therefore very desirable. Attempts should be made to alleviate or prevent the formation of any layers in the soil profile. Core cultivation is the best method to disrupt layers and improve downward water movement. Topdressing programs should be done correctly to prevent layering. Watering should be restricted to syringing to help dry out the black layer. In addition, because roots are usually killed by the gasses released in the black layer, the root system is so shallow that syringing is needed to maintain the turf. Our current research is aimed at developing treatments to disrupt the black layer and improve drainage. Wetting agents should be helpful in preventing the black layer from forming by improving water percolation. However, once the black layer forms, wetting agents would be of limited benefit.

We stress that the above explanation is only a hypothesis, but one we feel describes the current problem. Research is underway to prove or disprove this hypothesis.

Credit: Patch of Green 2/87

WATER

By: Paul Richter

Water, H_2O, the most essential group of elements that we apply to the turf; without water none of the activities which produce healthy turf will occur. In Michigan we are blessed with an abundance (in some areas an over abundance) of this fundamental resource. The water is relatively easy to obtain, of good quality, unlimited quantity, and inexpensive (after initial installation cost, only the cost of the electricity to pump the water into the golf course). The Great Lakes region has another water bonus - in Michigan, an average of 31 inches of precipitation. The western states (my personal experience is in Montana and Northern California) are not so fortunate. The fact of the matter is that the availability of irrigation water for golf courses is a contrast to the Great Lakes region; water is difficult to obtain, of suspect quality, regulated quantities, and expensive. Top this with an average rainfall of less than 15 inches in Montana and in California, zero precipitation during the growing season. And the superintendent is faced with a monumental challenge for the acquisition and management of this most essential of elements.

In Michigan, obtaining water for a golf course is a relatively simple procedure and ALmost always the water is of usable quality. If the golf course is located on a river, stream, or lake, an intake is dropped into the body of water and it is pumped with a little filtration directly onto the golf course. Should the golf course not be located on a sizable body of water, then a well is drilled and in most cases, a good source of water is located within 200 feet of the surface. Either method of acquistion supplies the golf course with an unlimited quantity of water desirable for

irrigation for little cost other than the electricity to pump the water onto the golf course.

A superintendent in Michigan rarely is required to depend on the irrigation system every night for the entire growing season - three weeks is a long time to go without rain even in the driest summer. There are some obvious benefits to natural rainfall: it evens out the imperfections in the irrigation system, flushes impurities from the soil, replenishes our water source, and gives the superintendent and crew a day or night off.

In the west, life is not so simple when it relates to water; a wide variety of sources and methods of acquisition are utilized. Briarwood Country Club, located in Billings, Montana, pumps water directly from the Yellowstone River over a 300 foot ridge and two miles through a pipeline into its irrigation reservior. At the Yellowstone Country Club, also in Billings, the irrigation water is supplied by two irrigation ditches and effluent water. The effluent water, about 100,000 gallons per day, is the only constant source. During the hot summer days the farmers of Yellowstone Valley irrigate a variety of crops from the irrigation ditches used by the golf course. If the farmers need more water, the golf course receives less, until, at times, the course is completely cut off. One of the irrigation ditches is one mile from the golf course and water must be piped the distance into the club reservior. At times during the summer the superintendent is required to be very conservative and occasionally only water greens and tees.

Wells are expensive to drill in Montana because of the depth required to reach usable water, generally 400 feet or deeper. The aquafers in this region do not have enough water to supply the demand of a golf course, even if water is found.

Northern California's situation is slightly different than Montana's; however, the means to acquire the quantity of quality water required for a golf course is not simple. At Castlewood Country Club, a 36 hole golf course and sub-division in Pleasanton, California, the irrigation water for one golf course is supplied from two wells, approximately 150 feet deep, that dump directly into an irrigation reservior. For the other course and sub-division, the water is supplied by the City of San Francisco, of which 90 million gallons is free. This lasts until late July, after which water is purchased. The San Francisco water is pumped up an elevation of 750 feet into holding tanks and gravity fed to the irrigation system and into the sub-division. At times during heavy use periods or a breakdown, there can be a shortage at which the sub-division residents receive first claim to the available water.

After the expense and engineering to obtain the water is finished, occasionally the quality is less than desirable; high PH, bicarbonate, and salts occur naturally in many streams and aquafers in the west; other problems include heavy metals in effluent water and very fine silt after snow melt and rains in creek water. All of these can create soil conditions which are detrimental to growing quality turf.

Nature is of very little help in this arid region of the country; South Central Montana receives 14 inches of precipitation a year and San Francisco Bay area about 20 inches. Montana's rain falls regularly throughout the growing season; however, precipitation is sporadic in July and August. Irrigation is a way of life in California since essentially no rain falls between mid-April and mid-October when temperatures soar to between 90° and 100° for extended periods and the humidity drops to 15 percent. Nature is of no help during the growing season. The superintendent relies solely on the irrigation system for six months. Never a cooling summer rain to give the golf course and superintendent a break.

Although we are faced with many challenges in growing turf in Michigan, the challenge of bringing the most essential ingredient to the golf course is relatively simple. Other regions of the country are not so fortunate and must use imagination, engineering, and money to obtain that which is so readily available in Michigan.

DEDICATION/SACRIFICE

In our profession some, indeed many, might find it very hard to separate dedication to the job and sacrifice for the job. It must be done for personal and family survival. For some, in their present job at least, it is already too late.

I am just several months short of my sixtieth birthday. I have spent about fifty of those years on and in golf course work. There is nothing like being the only one on a golf course at the break of day with the long shadows casting patterns on the sparkling dew covered fairways, perhaps a mist wafting up from the lakes, and the singing of the early rising birds before the sounds of progress (?) drowns them out.

This is especially true if you have been the one responsible for the first class condition of the course. Gazing out across a well groomed course gives me a tremendous satisfaction.

I have always liked the work. I may not have always liked the working environment, but always the work. Carrying out stupid projects or orders issued by a committee chairman whose only "qualification" for the job is his 2 handicap, can grind one in so many ways.

One will find the golf course to which he has become in charge, existed in more or less playable condition and will continue to do so after he has moved on to another. One can only perversely hope it won't be in quite as good conditon as when he was there.

I was told one time that being a salaried superintendent meant that I had to do what ever the job required. This is fine as far as it goes. The problem is that so many of us have carried our job far beyond what is required in order to have ourselves seen in a better light. The problem with this is that the condition then snowballs—the more you do the more they expect.

Oh sure. You'll get patted on the back, you might even get a raise, at a dinner the gathering might be told they couldn't have such a good course without you, but for the next week the humidity is 83⁄, the daily temperature 92 and the night time temperature 76 and you are looking for another course to go to. The years you might have spent extra nightly hours and extra hours on weekends and even holidays are completely forgotten. You have been suckered in!

Take time for your wives and familites. Be at home and **help** your kids grow up. Be there when your wife and family need you and COMMUNICATE! Treat it as a regular eight hour working day with a few hours on Saturdays and a couple of extra hours thrown in now and again. You'll get the job done—today or tomorrow.

You think it can't be done that way? You think mother nature throws you too many curves? Just stay ahead of your job. Your brain can be on the job twenty hours a day without your being there. That is why you have a crew. That is why you have an assistant. That is why you have a night water man. Use them. You don't have to do it all yourself. If you don't have all this help then the job is even less demanding, except in your own mind, and you actually have an even easier time of it

—Bob Klingensmith
Superintendent—Hi Level G.C.
Kossuth, PA
Three Rivers Green

6 ANSWERS TO QUESTIONS WE NEVER THOUGHT YOU'D ASK

(BUT DECIDED TO ANSWER ANYWAY)

1 **Yes, GCSAA can help you become a better superintendent.** One way it does this is through educational seminars and conference sessions it sponsors each year to help you become better informed about turfgrass diseases, pesticides, landscaping and management practices.

2 **Yes, GCSAA is helping to further the advancement of the turfgrass industry.** Through the GCSAA Scholarship & Research Fund, Inc., GCSAA provided more than $13,500 last year in research grants to leading turfgrass programs. GCSAA also provides educational opportunities to turfgrass students through annual turfgrass scholarships.

3 **Yes, GCSAA provides a meeting ground for superintendents.** Each year, GCSAA sponsors an annual conference and show for its members. Last year more than 6,500 educators, industry representatives and members from all over the world attended. GCSAA's executive committee decided at its last board meeting that the conference experience is so valuable that first-year members should be encouraged to attend by being given free admission.

4 **Yes, GCSAA offers recognition for superintendents.** Through its public relations efforts, its magazine, and its award programs, GCSAA helps promote the image and the professionalism of the superintendent. GCSAA also provides information to superintendents about how they can use public relations to promote their own image to their course, their community and their association.

5 **Yes, GCSAA provides each member with a life insurance program.** Supplemental insurance, disability and pension programs also are available.

6 **No, GCSAA can't help you with your golf handicap.** You'll have to work on that yourself.

GCSAA

The association that offers you more than just a name.

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NATIONAL CONFERENCE

The 58th Annual International Golf Course Conference and Trade Show of the Golf Course Superintendents Association of America (GCSAA) was the largest in the Association's history. The Conference Show, held in Phoenix Jan. 26 - Feb. 2, 1987, broke records in attendance (12,588); number of educational seminars (29); number of exhibitors (331); and amount of exhibit space (108,500 net square feet).

The conference began with educational seminars -- almost 400 hours were offered throughout the eight days of the conference -- and ended with more educational seminars, sessions and special events. Among the highlights of the conference week activities were award presentations, personal appearances of famous speakers, a huge trade show, a gala banquet with big-name entertainment, allied golf association seminars and more education programs.

Twenty-nine educational seminars were presented by 44 instructors to over 1,500 students earning continuing education units (CEUs). Seven of the 29 seminars were new to GCSAA programming.

* * *

The Opening Session speaker on Jan. 29 was National Football League Hall of Fame quarterback and former Green Bay Packers Coach, Bart Starr. Following Starr's comments, GCSAA President Riley L. Stottern, CGCS, presented the Association's prestigious Distinguished Service Award to Dr. James R. Love, WI, and David S. Gourlay, Sr., Canada. Stottern also presented GCSAA's Leo Feser Award to David Harmon, suprintendent at the Golden Horseshoe Golf Club in Williamsburg, VA, for his contribtuion to *GOLF COURSE MANAGEMENT* magazine.

Gerald L. Faubel, CGCS, board member and chairman of the GCSAA Scholarship and Research Committeed, presented seven students with financial aid scholarships to assist in their pursuit of turfgrass management careers.

The traditional ribbon-cutting ceremony by the Board of Directors to officially open GCSAA's Trade Show occurred Saturday before a packed lobby at the Phoenix Civic Plaza. Among the 332 exhibits were 81 exhibitors new to the show -- another new record. Last year in San Francisco, 317 companies exhibited their products -- 74 for the first time, and in Washington, DC, the year before, 292 exhibits were on display.

Educational programs were also conducted by the USGA Green Section, the American Society of Golf Course Architects, the National Golf Foundation (NGF) and the Sports Turf Managers Association (STMA).

On Feb. 2, GCSAA's annual membership meeting and elections were conducted. Elected to serve the Association for the coming year were Donald E. Hearn, CGCS, President; John A. Segui, CGCS, Vice President; Stephen G. Cadenelli, CGCS, and Randy Nichols, CGCS, Directors. Gerald L. Faubel, CGCS, William R. Roberts, CGCS, and Kenneth A. Sakai, CGCS, continue on the Board as well. Dennis D. Lyon, CGCS, was appointed Secretary/Treasurer. Immediate Past President Riley L. Stottern, CGCS, will serve on the Board of Directors for one year.

President Hearn said to a full house at the annual Banquet Feb. 2, "I am very honored and humbled to assume the presidency of GCSAA. This is a great time for GCSAA and its membership to grow and expand its services."

Later in the program, NBC commentator Jay Randolph presented GCSAA's highest honor -- the Old Tom Morris Award -- to Robert Trent Jones, Sr.

"Trent Jones is the Beethovan of the golf world, designing one masterpiece after another -- and you, the superintendents, make each design sing with beauty," stated Mr. Randolph.

Jones accepted the Old Tomm Morris Award and then shared personal thoughts and concerns about the future of the game he loves so much. "The design of courses will be hurt tremendously if they don't do something about the ball. It's too hot (long) nowadays. These guys are driving past the natural designed obstacles that make skill part of golf."

Following the banquet and award presentations, Marie Osmond and the Osmond Brothers entertained the audience with a blend of pop and country and western tunes.

GCSAA's 59th Annual International Golf Course Conference and Show will be in Houston, Feb. 1 - 9, 1988.

For further information, contact Bob Still, Media Relations Manager, GCSAA, 1-800/472-7878.

SHOULD WE BE USING THE WALKING GREENSMOWER MORE?

by Bill Zuraw, Superintendent
Crumpin'Fox Country Club

Through the decade of the seventies, the golf course and turf industry experienced a technological revolution. Many types of sophisticated maintenance equipment became popular because they could reduce labor costs. One of these was the triplex greensmower. Since many courses are built with greens in excess of 4,000 square feet, the job of mowing can be greatly reduced by a riding triplex. Today, there are very few golf courses that do not use triplex greensmowers. But the walking greensmowers still have a place in the golf course industry. I would like to discuss some comparisons and advantages which I have discovered.

From an economic point of view, triplexes save on time and labor. But how much? At Crumpin'Fox Club, one man on a triplex can mow ten greens in about two hours. I found that two men with walkers and cushman can do the same job in less time. So labor costs are less than doubled. The walker mower costs less than the triplex initially, but also is simpler to maintain. The engines are small and inexpensive to replace and there are no costly hydraulic components. There are no tires to leak, batteries to die or hoses to drip oil. They are easier to adjust. It is very difficult to get all three units of a triplex to cut exactly the same. With only one cutting unit, that is no problem.

I also found that the walker can help the superintendent to grow better turf. Although compaction pressure of a triplex is probably less than that of a golfer walking across a green, the repeated tracking in the same ruts on the cleanup cut throughout the season can cause compaction. Another point to consider is the turf areas surrounding the greens. If these areas are sloping, bunkered or too narrow, there will be considerable wear to the turf. The turf will always appear weak and may be the first to die out under stress.

With walkers it is easier to train operators, since the machinery is less complex. There is also a higher degree of safety with a simpler and lighter weight machine. I also found it was easy to do their tasks at the same time. Since we transport between greens with a cushman and trailer, it is no problem to move cups, tee markers and put out water coolers in the same trip around the course. In this way we are getting the same jobs done in the same amount of time without using a triplex.

I am not saying that we all should park the triplex. They are a useful labor saving tool. However, many golf courses could benefit from more frequent use of walkers on some greens or part of the time. The layout and design of Crumpin'Fox made my switch to walkers an economic as well as agronomic success.

Credit: Turf Talk

GRAND RAPIDS OPEN

The Grand Rapids Open will be held June 25-28 this year. Anyone carrying a membership card for GCSAA will be admitted without charge. If you are a member of the local, but not the national, and you are interested in attending please contact Jeff Gorney.

LORDY - LORDY
LOOK WHO TURNED 40
IF YOU KNOW THIS SUPERINTENDENT CALL AND WISH HIM HAPPY BIRTHDAY

BARRIER NETTING

BY Andy Lindquist
Superintendent, Brookview Golf Course

The "simple" task of installing protective netting to contain golf balls can become a major project for any superintendent. At Brookview Golf Course we have two 50' x 450' barriers dsigned to contain stray range balls. Over the last few years, we have tried various methods of installation, but this has seemed to work the best for our course.

TYPES OF MATERIAL

A. Nets. After trying all major brands of netting, we have found that "you get what you pay for." The less expensive nets are weaker, do not weather as well, and are generally undersized. You may order a 25' x 150' net and get a 20' x 125' one which you try (with the strength of Godzilla) to stretch to 25' x 150'. It is important to remember that you will be up in the air trying to work with a material that catches a great deal of wind. Nets may be custom ordered with the largest single piece being 25' x 150'. The nets should be 60 lb. tensile strength and a maximum of 1" mesh size. You can expect a five to seven year life expectancy, assuming the nets are removed during the winter.

B. Supports. Utility poles (class 3 or 4) treated or untreated made from West Coast Douglas Fir are the best to use. Holes 1" in diameter at every 11 feet are predrilled in order to install eyelets through the pole. Any excess threads should be cut off as they can rip the net if they catch in it.

C. Cable. Cable is strung around the entire netting using 7 x 7-$^{3}/_{16}$" airplane cable. To prvent the cable from cutting through the netting, hog rings are attached to the cable and netting every 8-12". Cable is also run horizontally through the middle of the net (every 11.5'). Without this center cable, too much stress is put on the outside of the netting, causing it to rip.

D. Installation. Poles are installed with at least 35% of them in the ground (i.e., a 50' high net would require a 67' pole). Don't let all of the holes in the netting fool you. They catch a great deal of wind, so good support is needed. Back fill around the pole with class 5 gravel. The cable is attached between the top of each pole to provide lateral support to the poles. The last poles are wired to the ground using 8" diameter landscape anchors.

Poles are placed 45' apart (not 50') to allow for some sag in the netting.

The netting is prepared on the ground and lifted into place. Weight is not a problem, but the wind is, so two ground people are needed to steady the net. To speed up the attachment procedure, use 1-½" spring loaded clips to attach the cabled netting to the poles and to the lateral support cable between the poles. Two landscape anchors are installed between each set of poles to attach the bottom of the net to the ground.

(Continued on page 12)

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The Greens King® IV with the revolutionary new Turf Groomer™ greens conditioner has no equal for producing faster, truer greens, *without* lowering height of cut.

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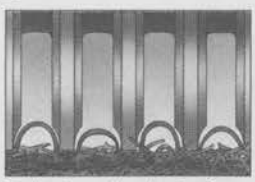
Then, the powered knife blades rotate *through* the slots in the front roller, cutting horizontal runners and removing thatch that can choke a green to death.

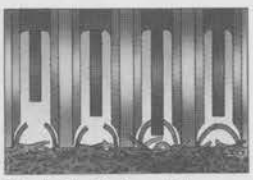
The reel follows closely behind, neatly cutting the grass while it's still standing straight and true.

The result: Faster, truer putting and healthier, hardier greens, ready for play. And, you get all this without reducing the height of cut.

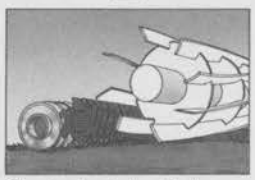
So, contact your Jacobsen Distributor to arrange a free demonstration. And, put this revolutionary new greens care system to the test on your own proving ground.



Exclusive roller design features bevelled edges to "pucker-up" horizontal runners.



The knife blades rotate through slots in the front rollers, slicing horizontal runners before they lie down.



The horizontal reel follows closely behind to clip grass while it's standing straight, for faster, truer greens without lowering height of cut.

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(Continued from page 10)

Materials: The materials are not inexpensive. For a 50' x 150' section, the following is needed:

(4) 67' fir poles @ $500.00 each	$2,000.00
(2) 25' x 150' nets @ $500.00 each	1,000
700' of 3/16'' 7x7 cable (net) @$.20/foot	140.00
300' of 3/16'' 7x7 cable (support) @ $.20/foot	60.00
(8) landscape anchors @ $10.00 ea.	80.00
(1000) hog rings @ $8.00/1000	8.00
(50) 1½'' clips @ $1.50 each	75.00
(20) eye bolts @ $2.50 each	50.00
Miscellaneous	50.00
Aspirin	5.00
TOTAL	**$3,468.00**

These costs do not include labor costs for installation or boom truck costs. We used a boom truck because of the height, but if your net is less than 30' from the ground, a self propelled lifting platform would work best.

If you plan to use netting, I suggest the following:

1. Try other alternatives.
2. Visit others who have installed netting.
3. Consider any idea on how to install the netting; do not rule our the 'weird' ideas.
4. Install netting on calm days.
5. Design the netting so it can be taken down and reinstalled easily.

Credit: Hole Notes

MILORGANITE INNOCENT
NO LINK TO ALS

On Thursday, February 19th, a distinguished panel of federal and state health officals declared that there is no scientific data to show a link between Milorganite and amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease). The officials included:

Dr. Alfred A. Rimm, Chief of Biostatistics
Medical College of Wisconsin

Dr. Henry Anderson, Chronic Disease Epidemiologist
(Wis.) State Division of Health

Dr. Patricia Murphy, Epidemiologist
U.S. Environmental Protection Agency Cincinnati

The panel's analysis of the remarks of Dr. Benjamin Brooks regarding Milorganite demonstrated their uncompromising support for Milorganite as a safe product. At one point, Dr. Rimm stated to Dr. Brooks:

> "I sort of feel that you have found a product guilty of murder, and it's totally innocent."

The panel also stated that:

> There was no difference between the ALS death rates in southeastern Wisconsin and the national rates.
>
> There is no evidence to indicate an increased incidence in ALS in Milwaukee County or Wisconsin.
>
> Associating the disease with Milorganite was premature and speculative.

Nevertheless, the Milwaukee Metropolitan Sewerage District is continuing to study the question of whether further research by three internationally known medical experts should be undertaken at this time.

MILORGANITE & ALS

The following facts are intended to answer any questions that you may have over the recent publicity about Milorganite & ALS. If you have any other concerns, the Milorganite Marketing Staff will be more than happy to provide further information.

AMYOTROPHIC LATERAL SCLEROSIS (ALS)

Doctors do not know what causes ALS. Over the years, a wide assortment of causes have been suggested. These include viruses, poisons, exposure to electrical shock, exposure to house pets or animal carcasses, back and limb trauma (e.g. from athletic injuries), genetic diseases, hormonal abnormalities and many more.

None of these alleged associates has ever been proved. The disease remains a mystery. Unfortunately, Milorganite was included in this unproven group of contributors when a San Francisco 49er football player listed it among a wide variety of things that three former teammates who contracted ALS might have come in contact with. The three had played together on the same field for the 1964 season. It is not even certain if Milorganite was actually used in their turf maintenance program.

ALS existed before Milorganite was produced.

ALS occurs in countries where milorganite is not, and never has been, produced.

As well as the wide variety of substances and circumstances that have been considered as potential causes of ALS, the disease also occurs in clusters of geographic "hot spots." For example:

A South Dakota outbreak was originally attributed to naturally-occurring selenium in the soil. Investigation eventually showed this was not the cause. The real cause was never identified.

There has been a recent outbreak of ALS in Guam. (No Milorganite has ever been sold in Guam.) In this case the cause was attributed to a hormone in the local foodstuffs.

MILORGANITE-THE PRODUCT

The Milwaukee Metropolitan Sewerage District is confident that Milorganite is not a cause of ALS. The workers who make Milorganite have had the level of metals in their blood analyzed over the last four years. These tests proved that the people who manufacture Milorganite had no greater concentrations of heavy metals in their blood than the population in general.

There are many other reasons Milorganite is a safe and effective product. Primary among these is the production process and quality control measures the sewerage district employs to assure a clean and safe product. Specifically,

* The MMSD imposes strict heavy metal pretreatment procedures on Milwaukee industry. These precautions reduce the amount of heavy metals discharged into the Milwaukee sewer system.
* All wastewater is screened to remove debris and any large partricles.
* The treatment process itself purifies the sewage by converting it to living microorganisms. These are subsequently denatured and become and organic bio-mass, ready for further treatment. Acids are added to the bio-mass to assist in drying. This further purifies the material. This "cake" is then dried in ovens that reach 1,200°F. The particles spend up to 80 minutes in this sanitizing environment, which destroys all viruses affecting human beings. Spore farmers are reduced to levels well below that found in normal garden soil. Volatile substances and any acid residue are also driven off.
* Milorganite is screened again to ensure no unwanted debris has survived and that the final product has the right particle size distribution to assure proper nutrient release.
* Milorganite production is routinely checked every day to ensure it meets MMSD's specifications for purity, quality and nutrient levels as well as low enough concentrations of heavy metals. Any product that might fail these checks is simply not shipped.

HEAVY METALS IN MILORGANITE

The level of heavy metals in Milorganite is low. Many of the news accounts refer to "high concentrations" of heavy metals, which is simply not true. For example, cadmium, one of the metals about which there is significant concern, occurs in Milorganite at an average rate of about 35 parts per million. Another way to think about this is that the application of a 40-lb. bag of Milorganite to 2,500 square feet of lawn (as recommended

(Continued on Page 14)

(Continued from Page 13)

on the label) deposits one one-thousandth of an ounce of cadmium, about 1/100 the weight of an average grain of sand in every 22 tons of soil.

There is nothing in Milorganite that is not also found in the surrounding environment. No "new" chemicals are created in the manufacturing process. Even heavy metals are in rainwater, drinking water, soils, foods and the air. They also are in items we use every day such as mouthwash, toothpaste, toilet paper, bath soaps, baby oil, shaving cream, pesticides and other fertilizers. A person will take in much more of these substances in what they eat, drink or smoke than they ever will from using Milorganite.

For heavy metals to get into a person's bloodstream, the substance carrying them must be ingested or inhaled. It is extremely unlikely anyone would eat turf, soil or Milorganite. But, even if they did, the likelihood of ingesting enough cadmium to be dangerous can be illustrated using the example of vegetables:

> If an 18-year old person, who was a strict vegetarian, ate only the vegetables that he grew (in soil with an unadjusted pH) fertilized with a sewage sludge containing about 75 ppm cadmium (twice the milorganite level) for 50 years, he might acquire enough cadmium to possibly cause a problem.
>
> Another way to think about that is:
>
> A person would have to eat between 1-½ and 6 pounds of Milorganite a year before exceeding the upper limit of cadmium intake recommended as safe.

Concentration through inhalation has been ruled out in the tests showing MMSD employees' blood to contain no more heavy metals than non-employees.

EPA AND WIS.DNR

Milorganite has the backing of both Federal Environmental Protection Agency and the Wisconsin Department of Natural Resources.

Milorganite meets the fertilizer requirements for each state where it is distributed.

The Wisconsin DNR allows up to 7 times as much Milorganite to be applied to farm fields as would be applied to turf when following package instructions.

Milorganite qualifies as a "non-hazardous" substance according to the EPA.

Alan Rubin, Chief of the Wastewater Solids Criteria Branch of the Environmental Protection Agency, said on February 12, 1987, "As of now there has been no way to draw an inference that cadmium, chromium or other substances in Milorganite were linked to ALS. In the studies we have, we have never (emphasis added) seen any trends or statistics indicating a deterioration of people's health because of the use of sludges."

THE MMSD WILL CONTINUE TO PRODUCE AND MARKET MILORGANITE.

For 61 years, Milorganite has helped golf course superintendents and other turf managers maintain the highest quality turf. The Milorganite Sales Department will continue to offer the quality services of the Turf Service Bureau which includes the free soil analysis service.

As always, Milorganite will still have the qualities of:

- not burning,
- releasing all nutrients, major as well as micronutrients, especially iron, slowly as the plants need them.
- helping to break down thatch,
- helping to prevent various diseases and nematodes,
- adding valuable organic matter (75%), which increases the cation exchange capacity in sandy soil, the type of soils used in today's greens,
- indefinite storage because it will not cake,
- ability to melt ice and snow safely,
- and much more.

EARTHWORMS—FRIEND OR FOE?

by Bruce R. Williams, CGCS
Bob O'Link Golf Club

Earthworms are present in most topsoils throughout the humid areas of the United States. They eat organic leaf litter and thatch. While there are 5 families and 1800 species of earthworms reported, there are only a few genera which affect golf course turf. These include **Lumbricus terrestris, Allolobophora longa,** and **Allolobophora nocturna.** These species form permanent burrows (verticle) and do not burrow laterally unless food becomes scarce.

Over the years earthworms have been praised by turf managers for their role in thatch reduction. Many people think of them as nature's aerators. There is no question that the earthworm has had a positive impact on golf course turf. The only negative aspects reported, until recently, were the castings (feces) left behind on the finer maintained playing surfaces (greens and tees). It is not my intention to dispute the beneficial effects of earthworms.

In the 1980's we have seen great improvements in the playing conditions of fairways. Most noticeably there has been a reduction in the height of cut on bentgrass fairways. Triplex mowing has enabled us to reduce the height of cut from the 3/4 to 1 inch range to the 1/2 to 5/8 inch range. It may only be coincidental, but earthworm activity is much more noticeable under the reduced height of cut. The elimination of Bandane, Chlordane, and arsenicals in the late 1970s may also have contributed to increases in the earthworm population.

One acre can contain as many as 3,000,000 earthworms, which weigh 1,800 pounds and can produce 25 tons of casts each year. In the Spring, when soil temperatures are in the 40-50°F range, earthworms are most active and it is not uncommon to see as many as 20 casts per square foot. These casts are an attempt to clean out tunnels and are composed of soil and feces.

Earthworms, like Canadian geese, pose no problem with their mere existence, but rather by their byproducts. Casts are often so prevalent that fairways look as though they were recently aerated. This can have a negative effect on playability. The castings begin to take their toll on mowing equipment and can adversely affect reels and bedknives. Aesthetics are reduced on this fine turf.

The dilemma we face is whether the beneficial factors of earthworms outweigh the negative factors. This must be judged by the individual Golf Course Superintendent. There is no clearcut point of economic threshold. If you have a problem there is very little information regarding control and no materials labeled specifically for earthworm control.

While treating for other pests we have found that some chemicals will reduce the earthworm population. Benomyl

(Continued on Page 16)

(Continued from Page 15)

seems to act as an irritant and sends earthworms deeper into the soil without killing them. The casts are eliminated with this material and we may still derive the beneficial effects. Turcam, Orthene, and carbaryl will reduce the population. The synthetic pyrethrins will bring earthworms to the surface for collection.

At present there aren't any noticeable side effects from the control of earthworms on fairways. Mechanical aeration has improved and may compensate. Thatch is being managed with clipping removal, but we might need vertical mowing if a problem develops in the future.

Credit: Bullsheet

A SEED IS NOT A SEED

by Dr. Norman Hummell
Cornell University

Whether it be for overseeding an athletic field, renovating a golf course fairway, or establishing a new lawn, seed is one of the most important purchases the turfgrass manager will ever make. To put it plain and simple: What you plant is what you're stuck with; and correcting the mistake of purchasing poor quality seed may be time consuming and very costly.

The seed market is literally flooded with seed of varying degrees of quality. It is often very tempting for the turfgrass manager to purchase seed of questionable quality to save a few dollars. But when one considers the longevity of the area established and the headaches saved, the investment of high quality seed is really quite small. After you have decided which species and cultivars to plant, how do you know that the seed you buy is high quality?

The Seed Label

Many years ago the United States Department of Agriculture set standards that the seed industry must meet in order to sell seed. Later on, laws were written that clearly state what specific information about the seed should be on the label.

The principal factors influencing seed quality are purity and germination. Purity is the percent, by weight, of pure seed of an identified species and cultivar present in that lot of seed. For example, 25.3% of the sample mix in Figure 1 is Adelphi Kentucky bluegrass.

(Continued on page 19)

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(Continued from Page 16)

While purity is an important number on the label, it is an indication of quantity, not quality. When seed is purchased, not all of the seed is viable. There are some dead seeds. The listed germination represents the percent of pure seed that is alive, and will germinate under standard laboratory conditions. A germination test must be run for each species and cultivar in the blend or mixture. Since seed will lose its viability in time, the date of germination testing is listed on the label and should be noted. It is normally recommended that the test date should be no more than nine months prior to the date the seed is purchased.

In the seed production fields, it is difficult, if not impossible to keep those fields completely free of weeds. As a result, weed seeds are often harvested along with the grass seed. After harvest, it is also difficult to clean all the chaff, stems and leaves out of the seed. Therefore, a certain percentage of any seed blend or mix will contain weed seed, crop seed, and inert matter. The percent of each must be stated on the label.

Weed seed refers to undesirable plant sepcies not normally grown for profit, such as chickweed. The first impression one might get looking at the sample label is that the 0.5% is low and does not warrant concern. That may be true if the seed involved was a large-seeded weed species; however, if all the weed seed in that lot was chickweed, that 0.5% would represent several hundred thousand chickweed seeds spread on a 5,000 square foot lawn.

Crop seed includes plant species normally grown for profit, such as tall fescue, bromegrass, and others. Unfortunately, the consumer would not know which crop species are present, unless the total crop percentage is above 5%. Seed companies are then required to list the crop species by name. Seeding a Kentucky bluegrass blend contaiminated with tall fescue could be disastrous. The crop seed is a "Pandora's Box" that should not be fooled with. Purchase seed that contains little, if any, crop seed.

Credit - Bullsheet

PROFESSIONAL GUIDE TO LANDSCAPING WITH FLOWERS AVAILABLE

At last, a guide to landscaping with flowering annuals is available for the professional user. Whether a landscape architect or contractor, golf course superintendent, parks department supervisor, cemetery director, landscape gardener, or commercial grounds manager, the professional will find, for the first time, a complete guide to flowering annuals in one new, concise and complete booklet.

"The Professional Guide to Landscaping with Annuals" has been published by Bedding Plants Inc., non-profit association that disseminates information on flowering annuals, and written by noted horticultural writer Ann Reilly. The 28 page booklet contains 16 pages of full color

(Continued on Page 20)

(Continued from Page 19)

photographs depicting use and identity of a large number of flowering annuals.

The booklet contains sections on use, design, color selection, plant selection, planting and maintenance of annual beds and borders. Special charts outline plant height, flower color and requirements for planting distance, soil, temperature and moist conditions, low maintenance and cut flowers. A sample planting plan is enclosed with calculations as to how to determine the number of plants needed. There's a section on container plantings, plus a complete encyclopedia of plants with 63 photos and both common and Latin names identified.

The booklet is available for only $1.00 PLUS a self addressed 6" x 9" or larger envelope with 90¢ postage affixed. Write to "The Professional Guide to Landscaping with Flowers", Bedding Plants Inc., 210 Cartwright Boulevard, Massapequa Park, NY 11762.

SUPERINTENDENTS TO PARTICIPATE IN NEW CHAMPIONSHIP

Golf couse superintendents are pleased to be involved with PGA professionals, managers and presidents of the nation's country clubs in a national golf championship recently created by John Deere Company.

The announcement was made by Riley L. Stottern, CGCS, president of the 7,000-member Golf Course Superintendents Association of America (GCSAA), with headquarters in Lawrence, Kansas.

The event -- the John Deere/PGA Professional-Superintendent Championship -- will feature four-man teams competing in a scramble format at the 41 PGA Sections throughtout the country.

Qualifying is scheduled between June and September, with the 36-hole Championship in November. The date and site will be announced later. Teams will be made up of the PGA Professional, the Club's course superintendent, club president and club manager.

"It is gratifying, and fitting," observed Stottern, "that superintendents are recognized as among the most important people in the game of golf. It is they who make and keep our nation's golf courses playable. Many superintendents play golf frequently not only because they enjoy the game and are good, but also because they know it is the best way to understand how to keep their courses in the best possible playing conditions.

"GCSAA thanks John Deere for its development of the tournament. Our members are looking forward with great enthusiasm to playing in it with the PGA professionals, club presidents and managers, who also are so essential to the game and industry."

Gary Gottschalk, manager of John Deere's Golf and Turf Division, said the firm is "excited about the concept. This program provides an opportunity for the club professional and club superintendent to play together on a team with other club officials. I am not aware of any other competition like it."

MEETING SCHEDULE

May 19th.....Pine View G.C.
June 22.....Riverside
August 3.....The Moors
August 31.....Jackson C.C.
Golf Day
September 28.....C.C. of Lansing
Annual Meeting
November 7.....Cascade Hills C.C.
Fall Party

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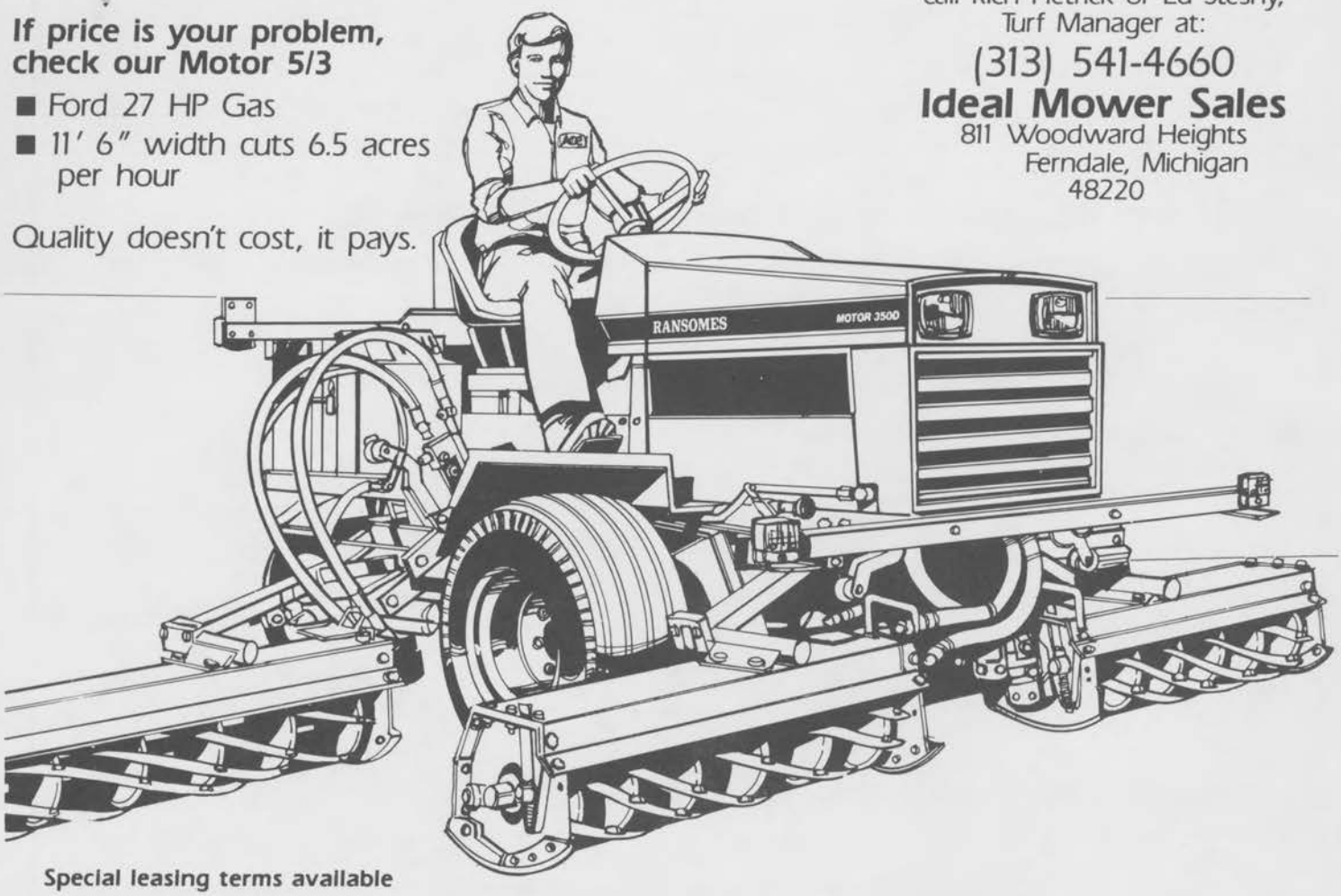

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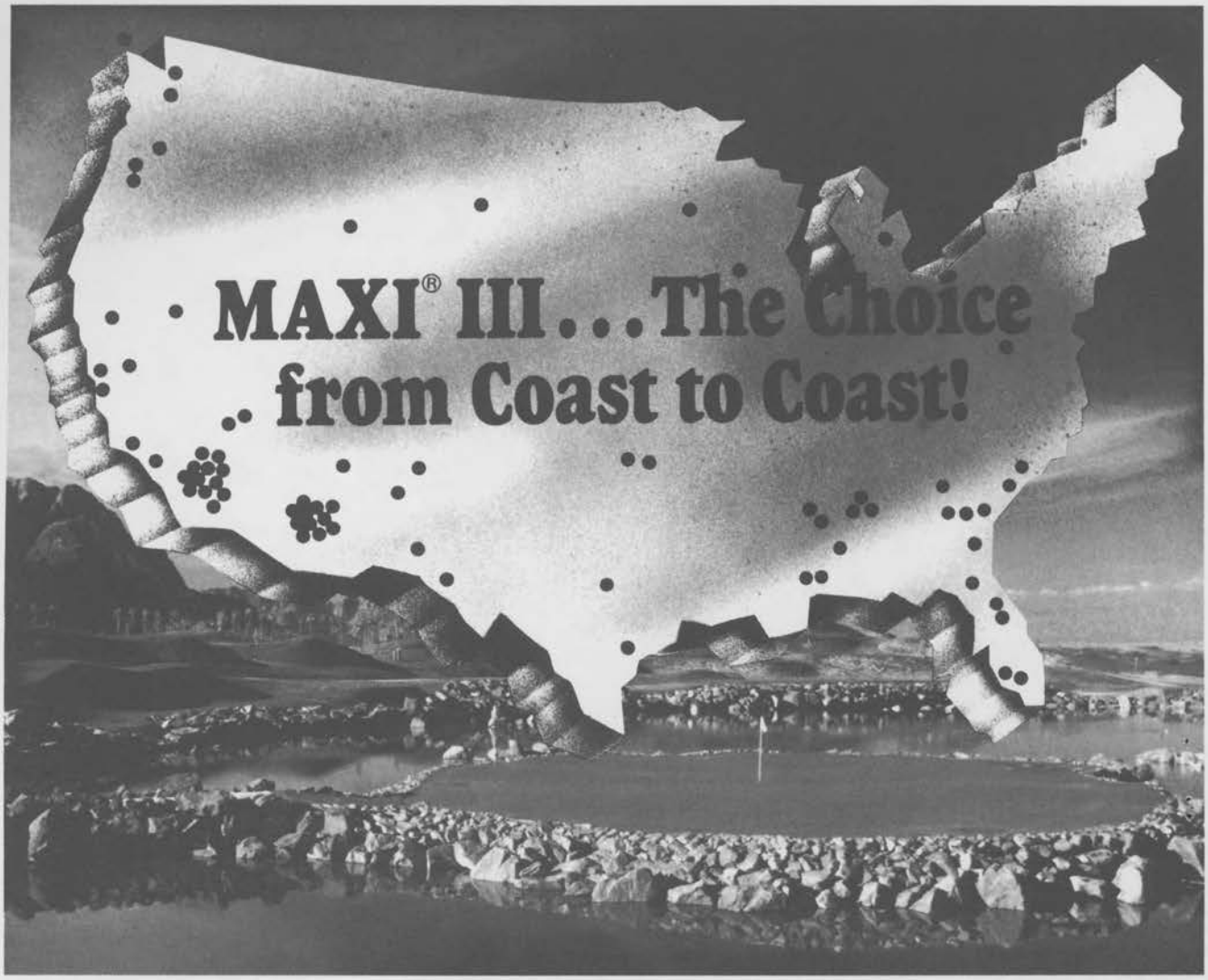

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