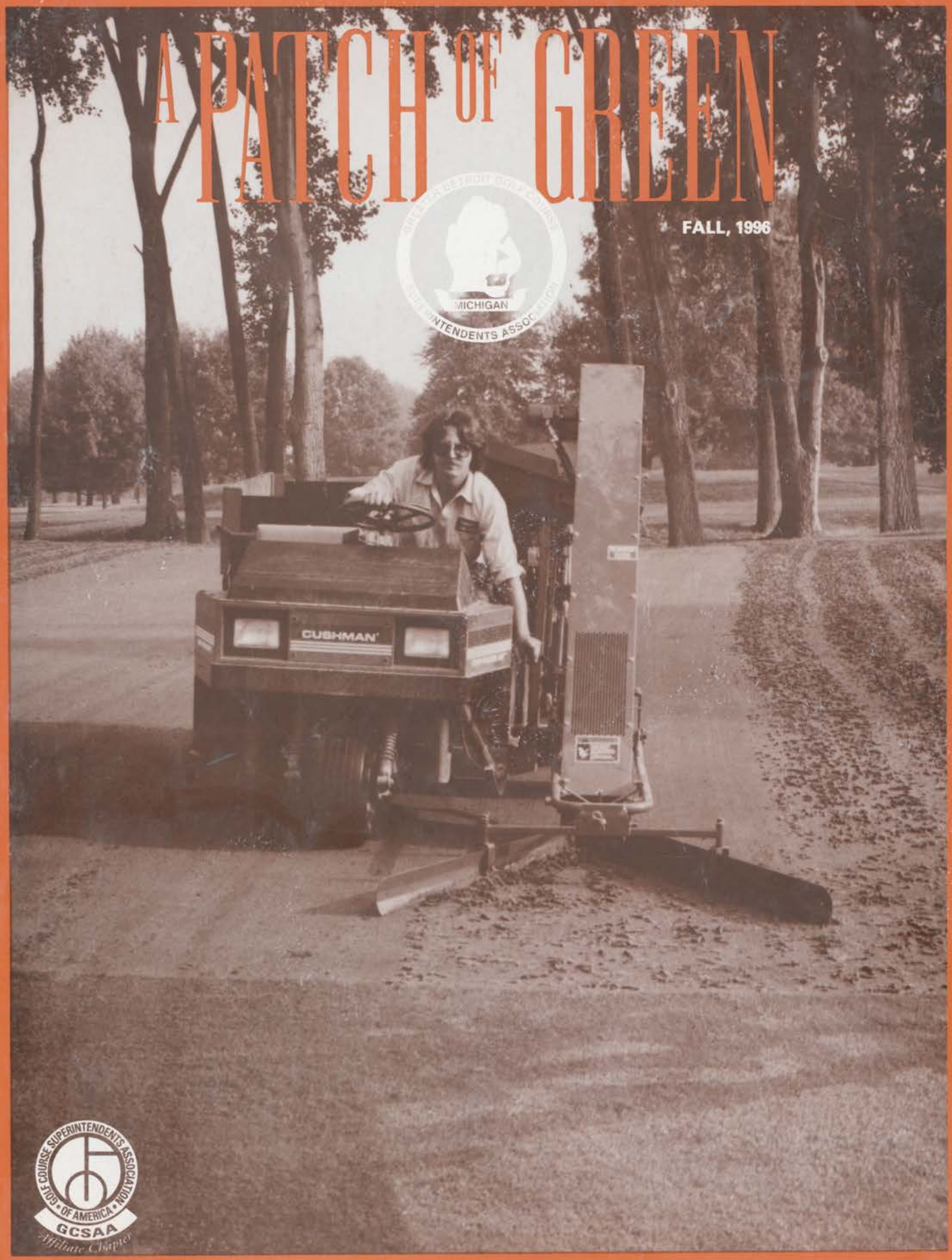
THE OFFICIAL PUBLICATION OF THE GREATER DETROIT GOLF COURSE SUPERINTENDENTS ASSOCIATION

A PATCH OF GREEN

FALL, 1996



GOLF COURSE SUPERINTENDENTS ASSOCIATION OF AMERICA
GCSAA
Affiliate Chapter

A PATCH OF GREEN

Greater Detroit Golf Course
Superintendents Association

The Official Publication of the Greater Detroit
Golf Course Superintendents Asociation

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CORRECTION: The title of the article on page 13 of the summer issue should have read "Ten Reasons To Try Non-Metal Spikes"

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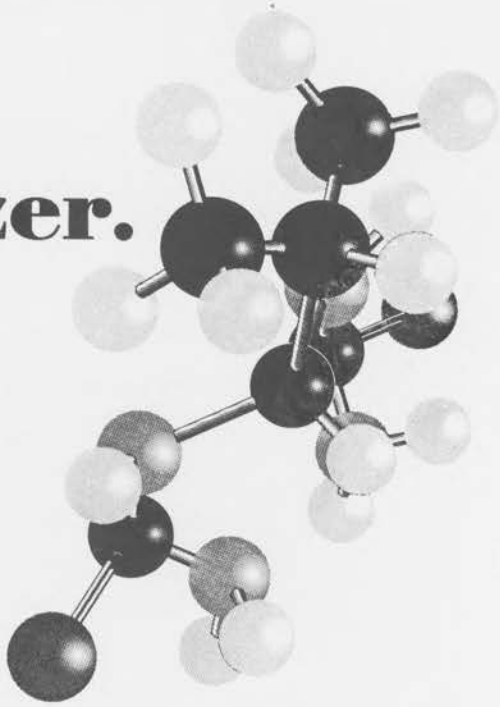

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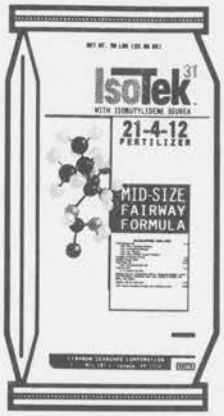

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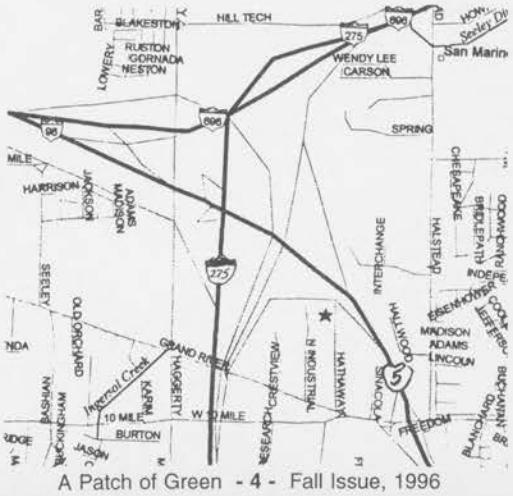

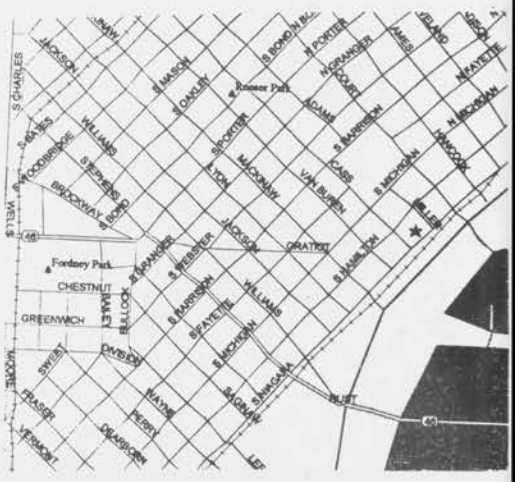

on par with the president

ETHICS (eth' iks) ***n.pl.*** **1.** The principles of honor and morality. **2.** Accepted rules of conduct. **3.** The moral principles of an individual.

"Morals are an aquirement -- like music, like a foreign language, like piety, poker, paralysis -- no man is born with them." -- Mark Twain

That is the literal definition of the word, to clarify its meaning for each of us. The quote may be telling each of us that we must **work** at achieving and upholding morals, or ethics, such as our code of ethics for the Greater Detroit G.C.S.A.

Pertaining to that code of ethics, its interpretation and all of its ambiguity, allow me to present three ficticous senarios that each of us could find ourselves involved in at any time during the our careers as golf course superintendents. These three senarios may or may not involve ethical or moral questions. You be the judge. Ethical questions can be interpreted and argued by both sides of a conflict until each is blue in the face. In my humble opinion, there are simply too many excuses that can be dreamed up when a much wanted, or much needed job is available, to explain away a question of individual morals or ethics.

So, as you read on you will find that I personally only have one thought on the matter of ethics...it is one simple idea. An idea that may enable us to prevent and to solve many of the problems associated with our code of ethics. An idea to put an end to the useless and often harmful rumor mills. An idea to, in the long run, strengthen professional ties amongst us all. I am certain there are many other possible ideas as well. This is just my one simple idea. I urge you to please consider its use; its potential benefit could someday be realized by each and every one of us.

Senario #1: Paul Annua has been an assistant superintendent for three years. A head superintendent position that he feels qualified for is rumored to be available,but has yet to be publicly advertised as open. Paul decides he would like to apply for the job. Before Paul proceeds any further, what should he do? *Answer:* Call the present superintendent.

Senario #2: Harry Roote is a successful and well known superintendent, employed at his present position for nine years. One day a member of the board of directors at a nearby country club plays golf at Harry's course and is duly impressed with the playing conditions. The member tracks Harry down on the golf course and proceeds to tell him that his club is very disappointed with its present superintendent and that they are letting him go. He further states that he has the ability to hire a replacement and asks Harry if he would like to have the job. Before Harry proceeds any further, what should he do? *Answer:* Call the present superintendent.

Senario #3: Dolly Spot is a golf course superintendent who has a friend who owns a golf course across town. The friend just recently purchased the course, and doesn't have much, if any, experience with the golf course industry. Since Dolly is a friend and has much experience with golf course management, the owner looks to Dolly for advice. He asks Dolly to visit the golf course, take a tour, and give him any recommendations that she may have on the care and upkeep of the property. Before Dolly proceeds any further, what should she do? *Answer:* Call the present superintendent.

There you have it. That is my simple idea and my simple solution to 99.9% of all code ethics dilemmas: Call the present superintendent.In each of the senarios, a simple phone call could prevent an undesirable situation from ever occuring. In senario #1 and #2, Paul Annua and Harry Roote should call the present superintendent to:

1. Confirm that the position is open.
2. Offer congratulations if the superintendent is leaving on his own accord, or condolences if the superintendent was let go.
3. Question the superintendent on particulars about the position and the golf course.
4. Ask for any advice or helpful tips.

If unable to reach the present superintendent for some reason, such as he/she has already left the position, try phoning the individual at home if at all possible. Most superintendents will be happy to offer any information they can about a job. Communication between professionals can prevent many undesirable situations and uncomfortable or untoward feelings from spoiling a potential mutually beneficial relationship. The worst thing that could happen would be for the individual to say "no". At least in your mind you will know you tried to communicate.

To conclude this statement about ethics and morality, please ponder the following quote and remember its meaning as you deal with your fellow golf course superintendents on a professional level: "I would rather be the man who bought the Brooklyn Bridge than the man who sold it." --Will Rogers

We could all do ourselves a favor to be as honorable and moral as we possibly can, whether pursuing job openings or offering a helping hand.

Paul M. Dushane

Paul Dushane

Greater Detroit Golf Course Superintendents Association Announces The Heritage Award

THE AWARD: Each year, three applicants will be selected to receive an award of $500. The basis for selection is an essay competition and the applicant's level of involvement with student or community affairs.

ELIGIBILITY REQUIREMENTS: Must be a son or daughter (dependent as per IRS definition) of a current GDGCSA member.

Must have successfully completed high school prior to submitting an application.

Must be enrolled in a post secondary educational institution on a full time basis. Applicant's chosen field of study must be *unrelated to golf course management.*

This award is not offered to students in post graduate college curriculums.

Must have exhibited involvement in student activities or community service.

APPLICATION: Please call (810) 362-1108 to request an application.

DEADLINE: For submitting application is November 1, 1996.

Chapter Delegates Meet at Headquarters

by Paul Kolbe

On September 7 and 8, I had the privilege of attending the Chapter Delegate seminar at the GCSAA headquarters in Lawrence, Kansas. Numerous delegates representing the chapters discussed many issues with the leaders of the GCSAA. Through these discussions, the leaders of the GCSAA will give their committees feedback on what direction the association should proceed.

Four mandates were discussed in detail. These mandates dealt with image, environment, chapters and career opportunities. The image mandate brought up the usage of more GCSAA logo apparel so that the GCSAA logo will be recognized by the public. When you see the logo, it will represent a professional, environmentally conscious, hardworking individual who helps preserve the game of golf. The current merchandise is very affordable and of excellent quality.

The financial status of GCSAA was revealed and with approximately $15 million budget 'til the year 2000, the net revenue is only $130,000. The education department has been a deficit expense for numerous years, with a 1997 projection to lose $100,000. There has not been a dues increase since 1991, so expect a proposal for a 20% dues increase in 1997. Dues represent only 17% of the total revenues produced, with over 50% of the revenues being produced by the suppliers.

Some other membership issues that could be voted on in Las Vegas are:

- splitting the class C classification into two groups with different dues structures and voting privileges
- giving complimentary memberships to class AA members, who are currently are charged $ 16 per year

The procedures for handling ethic violations were discussed with Frank Church, GCSAA lawyer representative. Numerous chapters experienced gross ethical misconduct, but with no backing from the GCSAA. In summary, the U.S. Constitution and the freedom of speech can not prevent an individual from pursuing a job; but the unprofessional misconduct of how it was pursued can be disciplined by the GCSAA and individual chapters. The current bylaws and standing rules for the conduct of members are currently undergoing legal review and on October 5, 1996 the ethic committee is meeting to resolve this disturbing trend.

The second day was spent listening to the 1997 GCSAA candidates for offices and questioning them on any issues about our industry. Jon Maddern, CGCS of Elk Ridge Golf Club and nominated by the Northern Michigan GCSA, is running for one of the three director positions.

Jon represented himself temendously during the question/answer session. Jon's background in our association and with the MTF as president will make him an excellent addition to the GCSAA Board of Directors.

The mandate on career opportunity brought to light some of the damaging trends in our profession. The list includes:

- devaluation of job's worth
- amount of turf students graduating
- uneducated employers
- age factor - older superintendents being replaced by younger and less experienced superintendents
- lack of professionalism in the industry

These were the highlights of the meeting. The GCSAA is growing and the services will expand. The GCSAA will provide the resources to improve your professional skills, but it's up to the individuals to take advantage of the opportunity. Get involved in the associations and better yourselves and be proud of our profession.

Frank Bartlett enjoys the lake view

Mother/daughter team at sack race

The balloon race was wet and wild

Doug Johanningsmeier cooks for the picnickers

Annual Picnic

Our annual picnic was held on Sunday, August 4th at Selfridge Air Force Base. Those attending spent the day in the sun playing games, swimming, eating, drinking and, oh yes, watching the Blue Angels cruise the sky. The day was bright and beautiful - perfect for watching these fighter pilots work their wonder.

Many thanks go to Mr. Frank Bartlett, our host, for all of his help in organizing this day of fun. He was tireless in helping to attend to every last detail, of which there were many. Also, I'd like to offer a special thanks to Mark McKinley, Doug Johanningsmeier, Jim McGuire and Bill Jackson for their input and help in organizing this event. They too went the distance in getting the job done.

For those of you looking to get involved with your association, this event would be a great one to get your feet wet. We can always use the help and you'll be sure to have a great time in a relaxed atmosphere. Give it some thought. Best wishes for an enjoyable fall season.

Rick Murphy, Picnic Chairman

Found: One pair of Islander black sandals. Call Murphy at (810) 363-0144.

Oakland Hills member Pete Jackson congratulates Steve Glossinger on job well done during U.S. Open

August Membership Meeting - Bay Pointe C.C.

August 8, 1996 our association honored Steve Glossinger, CGCS and his staff at a dinner meeting at Bay Pointe Golf Club. The entire evening discussion was on the successful U.S. Open at Oakland Hills Country Club.

Following dinner, Steve discussed, along with a slide presentation, the history of Oakland Hills leading up to the 1996 U.S. Open. The Donald Ross design layout and Steve's staff were severely tested following the torrential rainfall on the final practice round.

A courageous golf fan with a video camera video taped about 20 minutes of the destructive storm from the 9th green bleachers. His camera was running while lightning bolts and thunder encompassed the course. The aftermath of the storm was told world-wide from the numerous media sources that were present.

The effort of Steve's staff and the volunteers from our industry allowed Oakland Hills to be playable for Thursday's opening round. Beautiful weather followed the storm for the rest of the week and the tournament was unforgettable, with Steve Jones conquering the 8th hole and winning his first major.

The media exposure of Glossinger's work and our profession was covered comprehensively from the newspaper, TV and radio outlets. Appreciation for Steve's hard work was recognized by the GCSAA when Director Tommy Witt, CGCS from Wynstone Golf Club, Illinois presented Steve with a plaque of achievement. Also, Paul Kolbe, Vice President GDGCSA, presented a framed collage of various newspaper articles related to the tournament.

Peter Jackson, member of Oakland Hills, personally expressed gratitude on behalf of the membership for all the help our association members did to make the 1996 U.S. Open successful.

The View From M.S.U.

Late Fall Fertilization Philosophies

P.E. Rieke
Crop and Soil Sciences
Michigan State University

In the late fall there are still many projects which require the time and attention of turf managers. Many of the turf management practices done during late fall have a major impact on turf quality the following spring. Fertilization is one of the most important.

Phosphate and Potash

In the opinion of a few agronomists the key nutrients in fall fertilization are phosphorus and potassium, but most agronomists acknowledge that nitrogen management is the most important. Of course, if P is recommended (based on soil tests) this should be applied as needed. Because K is so important in stress tolerance, application of some K in both fall and late fall programs should be considered. On sandy soils some late fall K should be a regular part of the program. Potassium is easily leached from sands, so regular applications are needed and should be made in the fall and late fall, as well as throughout the year.

To be confident there is adequate potash in the soil, use a soil test for medium- and fine-textured soils. If tests suggest potash is needed, appropriate rates should be applied based on recommendations and common sense. Remember that recommendations for P_2O_5 and K_2O given in soil test reports are for the amount needed for an entire year. In fall and late fall, apply reasonable amounts to achieve the total needed over the year.

When late fall N fertilization is practiced, some potash should normally also be applied along with the nitrogen. Without benefit of soil test recommendations on finer-textured soils, apply potash at about half the rate of nitrogen. On sands without soil tests, use nearly as much potash as nitrogen in late fall applications.

Timing of Late Fall Nitrogen Applications

For cool season grasses, both fall and late fall fertilization should be considered. Fall fertilization is best done during September, preferably early in the month. With the weather changes in late summer and early fall (shorter days, cooler nights and more regular rainfall) the turf plant tends to grow less rapid vertically than occurs in the spring. More lateral growth results in improvement in turf density after the rigors of summer. Fertilization in the fall deserves top priority. More of the carbohydrates manufactured by photosynthesis at this time of year will be stored building up the plant for next year.

Normally it is best to withhold nitrogen applications during October to permit the turf to "harden off". If not applied earlier, low rates of N (½ lb. N/1000 sq. ft. or less) can be applied as needed to hold reasonable color and density. This can help improve turf density and permits the turf to accumulate carbohydrates. Heavier rates of N in early October should normally not be used as this could cause the grass to be come very succulent. Should a high rate of N be applied in late September or early October under excellent growing conditions (warm and rainy) followed by a hard freeze the grass leaf tips could be killed, reducing the potential for photosynthesis at this time of year.

There are a number of opinions as to how and when to use late fall nitrogen applications. In part, this occurs because of differences in climatic zones and variations from one season to the next. Perhaps the more important reason for variation in late fall fertilization is the objective for this practice.

In my opinion the most important objective of late fall nitrogen fertilization is to supply nitrogen to the turf after growth has ceased but when photosynthesis can still occur. This will **normally** take place anywhere from the last week of October in northern Michigan to the second week of November in southern Michigan near the lakes. It will vary with the particular year by a week or more. Some additional short growth spurts may require mowing after that time, but regular mowing is no longer necessary. At this time the root system is still active, since the soil is warmer than the air. Nitrate nitrogen can still be taken up and utilized by the plant. The fall of 1995 proved an exception with the early cold weather and loss of the typical weather during which carbohydrates can accumulate. This contributed to the poor start for turf in 1996.

If proper nitrogen fertilization bas been practiced during the fall period (September), the turf should still be green and physiologically active in the late fall. This permits the plant to continue photosynthesis whenever modest temperatures and some sunlight conditions occur. Carbohydrates manufactured during this time are not "burned off" with growth and clippings, but are stored. This builds up the plant for next year and permits root growth initiation in the spring, even before top growth begins.

If N is applied during late fall, this reduces the need for N in early spring. Nitrogen applied in early spring enhances top growth and mowing requirements at a time of year when growth is likely to be very rapid anyway. Carbohydrates lost with the clippings in the spring are obviously no longer available to the plant. It makes sense

to keep those carbohydrates in the plant as long as possible. With the hot weather of summer there is a natural reduction in carbohydrates. Keeping the carbohydrate level in the plant high enhances stress tolerance and keeps some reserves in the plant for recovery of turf density if needed.

Nitrogen Carrier

The choice of carrier is very important with late fall nitrogen fertilization. To accomplish the objective of getting a significant portion of the applied nitrogen into the plant right after application necessitates that the major portion of the nitrogen be from fast acting, soluble sources. Some of the nitrogen can be slow release, as much as 25% or so. This slow release carrier will provide a small amount of N next spring, but will not result any major response or flush of growth. Any of the slow release carriers should be acceptable for this portion of the fertilizer.

If straight slow release N sources are applied during this late fall period, there is not enough N available to the plant to provide the response desired of enhancement of photosynthesis and carbohydrate storage. This was very apparent in fairway studies we conducted on golf courses in Michigan several years ago. Some golf course superintendents like to use Milorganite right after Thanksgiving and have been pleased with the responses observed the next spring. This approach has been used with success for years, but does not accomplish the objective of carbohydrate storage during the late fall.

Rate of N Application

Rate of application of nitrogen to use in the late fall will again vary with turf conditions and philosophy of the turf manager. For greens, ½ lb. N per 1000 sq. ft. may be sufficient. If tees are still thin from traffic, especially on par 3 tees, ¾ to 1 lb. may be needed. Fairways could receive ½ to ¾ lb. Lawns and general grounds can receive ¾ to 1 lb. N. Some agronomists may encourage even higher rates as a general practice, but the increased potential for leaching of nitrates would suggest caution against using such higher rates of N. An exception might be football and soccer fields which have been thinned by fall play and need the extra boost from N. Rates as high as 1.5 lbs. N/1000 sq. ft. may be needed.

If late fall N has been applied the need for early spring N will be reduced. Many turf managers do not fertilize again until just before Memorial Day since the residual effect from fall and late fall applications have provided good color and density without the spring growth flush caused by early spring applications.

Late Fall N For All Turfs?

Some turfs may perform better without the late fall nitrogen. If the turf site is normally very wet in the early spring, which restricts mowing until significant drying occurs, late fall N should probably not be applied as there will be some early spring growth enhancement compared to turfs receiving no late fall N. This should be evaluated on a site by site basis.

Late fall nitrogen applications can result in increased snow mold disease. If turfs are hard hit by snow mold nearly every year and no snow mold preventative program is followed, it may be best to avoid late fall nitrogen, However, based on plot research done by Dr. Joe Vargas and on observations in the field it is clear that while in most years the late fall nitrogen may increase the amount of snow mold, there is a much quicker recovery from any injury caused. The snow mold damage may be more superficial with the late fall nitrogen and/or the recovery is quicker. Either way the next spring the turf returns to a better quality condition sooner when late fall nitrogen has been applied.

Other Pros and Cons of Late Fall N

Potential problems with late fall nitrogen fertilization include the potential for leaching of applied nitrogen, late fall growth which would require more mowing potential for more snow mold and other winter injury, increase in thatch and more growth in the spring. The potential for most of these concerns is considered small in light of the positive results.

The studies conducted here at Michigan State by Eric Miltner, Bruce Branham and myself compared late fall nitrogen treatments with those emphasizing spring applications. There was no significant leaching of nitrates from either treatment. If the nitrogen is applied while the plant is still physiologically active, the soluble nitrogen should be taken up and used so it will not be available for leaching over the winter.

While there may be a small increase in growth during the fall or spring, most turf managers are satisfied the benefits are far greater than the potential negative effects. There is no evidence that late fall N increases susceptibility to low temperature or crown hydration injury. In fact, if there is such winter injury, recovery may be faster if late fall N has been applied. There is evidence from a study done at Ohio State that late fall nitrogen may increase thatch accumulation to some degree.

Benefits of late fall nitrogen include good carbohydrate levels in the turf the next spring, good early spring root growth, good fall and spring color and good turf density so there is less potential for establishment of spring weeds.

With many advantages apparent for late fall nitrogen and few disadvantages, it is clear why so many turf managers have adopted this practice. I have not talked to anyone who has tried late fall nitrogen fertilization who has not continued to utilize the practice for agronomic reasons. This is the best testimonial for late fall fertilization.

GDGCSA To Host Equipment Maintenance Seminar

"Preventive Maintenance of Turf Equipment," an educational seminar co-hosted by the Greater Detroit Golf Course Superintendents Association and the Golf Course Superintendents Association of America (GCSAA), will be presented at the Novi Hilton, Southfield/Novi Area, Michigan, on November 8, 1996.

This one-day seminar will teach detailed preventive maintenance for turfgrass equipment. Participants will learn proper maintenance for engines, hydraulic systems, filters, brakes, drive trains, mowers, tires and more. Parts, service intervals and computerized record-keeping also will be covered.

This seminar will be taught by David Herman, an equipment technician with 15 years of training experience with Kohler Co., Briggs & Stratton Corp., The Toro Co., John Deere and Jacobsen Division of Textron Inc. Herman has developed computerized maintenance programs for turf equipment and is currently an assistant superintendent at La Paloma Country Club in Tucson, Arizona.

Registration in the seminar will include lunch and a take-home reference manual. Advance registration is required. Please call 800/472-7878.

Note: Media representatives may attend free of charge (excluding reference manual), but must register in advance.

Producing Quality Putting Surfaces Through Overseeding

by Mike Jones, Course Superintendent, Lochmoor Club

All superintendents know and concentrate on providing their membership with the finest turf on their greens. Many of us who are not on new courses or newly renovated courses have old greens that through the years have converted to "Michigan Bent"...Poa! With this we have the daunting task of producing a putting surface which will be smooth, true, consistent, fast and look good through the entire season. Poa, as we all know, does not want to cooperate all the time with these traits. Now do not get me wrong, I like Poa. It is a turf that has treated me well and I know I will be growing it for a long time. All we wanted at Lochmoor was to have the best without reconstruction. The best to us is a 50/50 or 60/40 ratio of Poa/Bent. We feel this will give us the best traits of both species. Grow Poa - Promote Bent; that is our motto.

Many a superintendent goes about trying to do this in different ways. The way we have attacked this mission at Lochmoor is as follows: Lochmoor was built in 1917 with old push up greens that were not so pushed up. Surface drainage was poor due to this and, with the amount of play, compaction and stresses were high. Poa flourished in these conditions and the greens were close to 100% Poa, maybe 90% at best. We now drill twice (2) a year with the Floyd/McKay Drill. This has helped immensely with our drainage and rooting. At this same time we will conventionally aerify with ½" tines. Because of a previous layer, we will then topdress with 100% sand (personally I prefer 80/20 mix), 10#/m of Sand-Aide, 5#/m of Menfee Humate and then terra broom to fill the holes ¾ of the way. One to three days later we topdress again to level the greens and overseed at this time as well. We have chosen and used Providence Bentgrass for this process, and we apply at 5#/m.

From this aerification process we move into a seasonal maintenance program. We aggressively double verticut greens every two weeks ¼" spacing on the verticut blades and ⅛" below the roller for the height. We then lightly topdress and overseed, approximately ⅛# Providence/m. The only time we do not overseed is the month of July. The total amount of seed for the season is about 2.25#/m, which costwise converts out to approximately $1,700, a small investment in our most important asset. Granted, most is wasted due to competition and intra-competion but the amount that does catch is very impressive and worthwhile. I would guess now in the three seasons we have done this program we are now at 25%, maybe 30% bent. We all know what it is like to guess our populations. So, if you would like to see it or have any questions, feel free to call me.

With the summer of 1996 the way it was we went one step further with this program this year. On August 12 we went in with a Ryan Mataway Overseeder, two directions at .25# Providence/m and then topdressed with sand, 2#/m Sand-Aide, and another ⅛# Providence/m drop seeded. Seven days later we sprayed 1 oz. Banol/m with ⅛# MAP/m. Two days before the seeding we had placed .6#N starter/m. We had great germination and will have to wait to next year before I can rate the success of the program.

It has been exciting and rewarding to see the progress of the greens through this program. If any of you have other ideas or procedures for establishing Bent in Poa, I would love to hear about it.

The following article is reprinted from the September, 1995 issue of Turfgrass Trends:

Relationships Among Soil Insects, Soil Insecticides, and Soil Physical Properties

by Michael G. Villani

Insecticides are applied to the soil for the control of Japanese beetle and other scarab grub species in areas where these pests damage the roots of turfgrass and landscape ornamentals. A noted chemist researching the use of insecticides for controlling soil insects once commented that, the more we learn about the interaction of the soil environment, insect behavior, and insecticide properties, the more we recognize it is a wonder that soil insecticides are ever effective in controlling insects.

Controlling soil insects in turfgrass is especially difficult because, in contrast to agricultural and garden uses, turf insecticides are not usually incorporated directly into the soil. We must rely on the movement of insecticide down into the soil where grubs are feeding to provide sufficient coverage for control.

Although many studies have been carried out to determine how specific insecticides act in the field, there is little information available on soil-insecticide-insect interactions that accurately predict insecticide performance in controlling this pest complex.

With this rather pessimistic starting point, I would like to discuss several reasons why soil insecticides should not be expected to kill white grubs in turfgrass and suggest how turfgrass managers might mitigate the impact of these factors, thereby increasing insecticide activity. Following this, I will present a case study undertaken by Dr. Rich Cowles (Connecticut Agricultural Research Station, New Haven) and myself in which we determined the impact of soil physical properties on the performance of several turfgrass insecticides labeled for use against Japanese beetle grubs. This study was carried out in several California soils.

Breakdown on foliage and surface

Insecticides deposited on grass blades and the soil surface are exposed to heat and ultra-violet radiation from the sun, which tend to decompose and deactivate them rapidly. Liquid insecticide must be washed off the grass blades, stems, and crowns before it has the opportunity to dry. Granular insecticide must also be watered soon after application to wash the active material off the carrier (clay or corn cob particles) and down to the lower thatch. For this reason, irrigation is essential for maximum soil insecticide activity against white grubs. If irrigation is not feasible, soil insecticides should be applied just before (or during) a predicted period of light, persistent rain.

As already discussed in some detail, the movement of pesticides into the ground water has been a matter of great concern. Research with turfgrass insecticides indicates that much of the active ingredient applied tends to become trapped in the thatch zone and thus does not move deep enough to reach grubs feeding at the thatch/soil interface. This has helped reduce fears that turfgrass insecticides cause significant groundwater problems; at the same time, however, it also makes grub control much more difficult.

Two major properties affect the movement of insecticides within the soil profile: water solubility and adsorption to organic matter.

Insecticides vary widely in their water solubility. The solubility of various turfgrass insecticides (technical grade) can be seen in Figure 1. Of the compounds recommended for grub control, trichlorfon (Dylox) has the highest solubility, while chlorpyrifos (Dursban) has the lowest. Solubility determines how rapidly insecticides are washed from

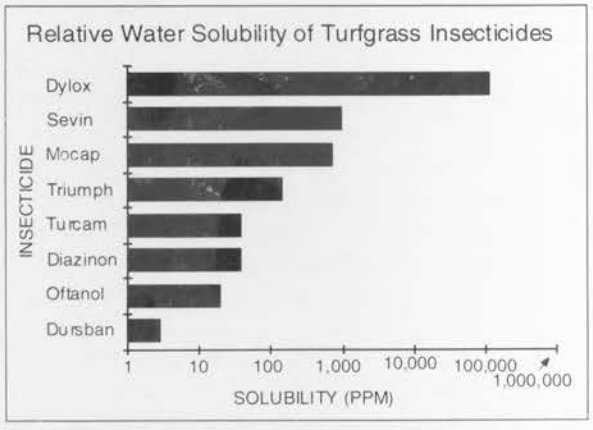

Figure 1. Relative solubility of turfgrass insecticides. Adapted from Tashiro 1987.

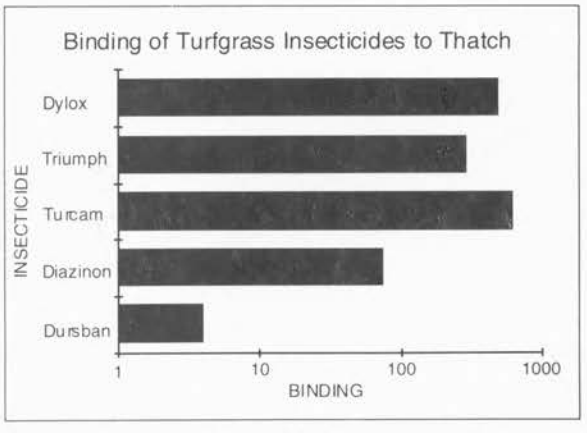

Figure 2. Binding affinity of turfgrass insecticides to thatch. Adapted from Niemczyk and Krueger. 1982.

turfgrass stems and blades, and from carrier particles. In general, in the absence of significant thatch accumulation, irrigation with at least 1/2 inch of water immediately after application should allow enough insecticide to penetrate into the upper root zone to insure adequate coverage of feeding grubs.

Thatch consists of decomposing grass blades and stems and other organic debris that accumulates between the soil surface and turfgrass foliage. Insecticides applied to turfgrass are absorbed by organic matter, preventing their movement to the soil surface. Because of their short residual activity (often less than one month), for modern soil insecticides to be effective they must move down through the thatch zone rapidly. In general, those insecticides that are least water soluble (chlorpyrifos, for example) have the greatest chance of being bound to thatch, while more soluble materials (trichlorfon, for example) are less affected. An exception to this general rule is bendiocarb (Turcam) which is relatively insoluble, but is less sensitive to thatch than are other, more soluble materials.

The propensity of turfgrass insecticides (technical grade) to bind with organic matter can be measured by determining the quantity of thatch required to bind a specified amount of insecticide. Figure 2 illustrates this. While high levels of soil organic matter or thatch will result in significant tie-up of any insecticide, chlorpyrifos has such a high affinity for organic matter that it is unsuitable for use as a grub control agent in organic soils.

Organic matter in soil also influences insecticide activity. Soils with organic matter levels greater than 5% can cause significant reductions in insecticide activity due to the chemical binding of insecticide molecules to soil organic matter.

Breakdown in soil

The physical and chemical components of a soil will also affect the longevity of soil insecticides. Most insecticides are extremely sensitive to high (basic or alkaline) pH. Trichlorfon (Dylox) will remain for several weeks in an acidic soil, for several days in a neutral soil, and only for several minutes in extremely basic soils. Most other grub insecticides are less sensitive to soil pH. For example, the impact of pH on the half-life (the length of time required for half of the insecticide to break down) of carbaryl (Sevin) can be seen in Figure 3. As pH increases, the insecticide decomposes much more rapidly (decreased half-life). Diazinon (Diazinon) is the only common turf insecticide that is acid-sensitive and will remain active for longer periods in slightly basic soils. High temperature, high levels of organic matter, and high clay content are other soil physical properties that tend to be associated with poor insecticide performance.

Soil is more than just a pile of dirt. Each cubic inch of soil contains millions of microscopic organisms that can break down insecticide molecules. Soils with large numbers of these microbes are termed "aggressive," due to the rapid rate at which some insecticides decompose in them. Although studies have suggested that a soil may be selectively aggressive (impact only a particular insecticide),

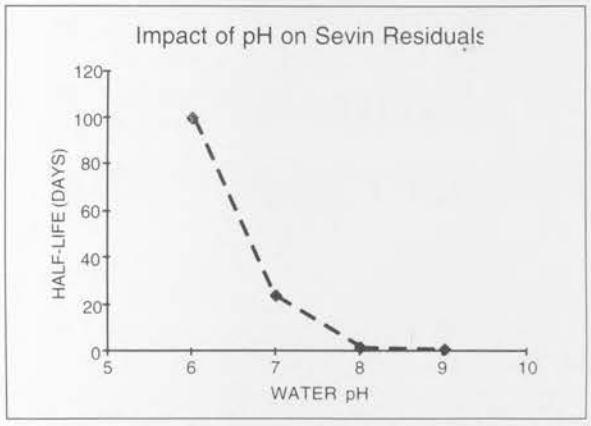

Figure 3. Relationship between pH and half-life of Sevin. Adapted from Tashiro et al. 1987.

other studies indicate that an aggressgive soil may have the ability to break down a number of turf insecticides.

Soil analysis for pH is the single most important tactic in reducing rapid soil insecticide decomposition. The testing of tank mixtures and irrigation water for pH levels will also reduce the chance of premature loss of insecticidal activity. Soil testing for percent organic matter and texture will also help predict if a site is predisposed to insecticide failure. There are no practical methods for deactivating an aggressive soil. Where a steady, persistent decline in a products activity has been documented, the best alternative is to switch insecticides.

Environmental Factors

In general, insecticides are most effective at warmer temperatures. In turfgrass, this is due both to the activity of the insecticide and the activity of the insects. Improved performance of an insecticide in warmer soils can most often be traced to an increase in volatility (evolution of vapors) of the insecticide, which increases as soil temperature increases. Unfortunately, as volatilization increases, insecticide levels in the soil fall, thereby reducing the insecticide's residual impact.

Insects are cold-blooded animals. As such, their activity is directly related to the temperature at which they are living. Grubs tend to feed and move more at higher soil temperatures. Since the effectiveness of an insecticide depends in part upon the amount of toxin an insect ingests, and how much toxin is absorbed through their cuticle (skin), an actively moving and feeding grub will contact greater amounts of insecticide than will a cold, sluggish grub.

Due to the relative immobility and short residuals of modern insecticides, the location of grubs in the soil will in part determine how successful an insecticide application will be in controlling them. Research indicates that, under normal conditions, insecticides will not be found at lethal concentrations at soil depths greater than one inch (or less, depending upon thatch levels). Environmental conditions can cause some or all grubs to move below the critical one inch depth. For example, grubs will move down into the soil profile in mid-to late-fall to escape winter temperatures; they

will not return to the root zone until the soil warms in the spring. Extreme summer drought can cause grubs to escape down into the soil, where cooler and wetter conditions are often found. Although grubs may move only an inch ot two down into the soil to escape these dry conditions, that may take them deep enough to escape a toxic level of insecticide.

Biological factors also cause grubs to be found deeper in the soil than expected. At high densities (more than 80-100 large individuals per square foot), grubs tend to disperse in the soil, often over a depth of two to three inches. They do this to allow some space between themselves and neighboring grubs, since they bite and kill each other if they are packed too closely. Turf root growth, grub species and development stage, and soil compaction and texture all affect the vertical distribution of grubs in the soil, and indirectly, the effectiveness of grub insecticides.

Not all insecticides (or grubs) are created equal

Every soil insecticide has a characteristic lag period from application of the material to maximal mortality of the targeted insect. This may range from several days for trichlorfon to several weeks for a more slowly acting product such as bendiocarb. The presence of this characteristic lag period must be taken into account when choosing a grub insecticide. A fast-acting, short-residual product may not reduce grub populations to levels one expects from a longer-residual product. It also requires much greater care in timing the application to ensure eggs have hatched and young grubs are actively feeding at the thatch/soil interface. Such a product might be ideal fot spot treatment of heavily infested turf, or alternatively, may be used on turf late in the fall or spring when persistence is not required, but rapid acyivity is. Conversely, a highly effective, long-residual, slower acting insecticide may be chosen when treating in late summer, when damage from small grubs will be minimal and increases in the grub population from unhatched eggs are possible. One should know the characteristic lag time for the various grub insecticides and use this information to help determine the most appropriate insecticide for grub control under specific management situations.

In an illustrative study, field rates of granular Turcam and Dylox were applied in early August to an irrigated golf course fairway in Syracuse, NY, that was infested with first instar Japanese beetle grubs (Figure 4). Grub counts were taken three, seven and twenty-one days after treatment to determine the specific lag time of these two products and the ultimate control achieved. Dylox provided greater initial grub reduction (three and seven days post-treatment) but short-residual activity curtailed overall grub mortality at twenty one days. By comparison, Turcam exhibited an extended lag time as seen in higher grub counts at three and seven days post-treatment. However, Turcam's longer residual activity resulted in continued grub reductions, as noted at the three-week evaluation point.

Although lawn grubs often appear similar, some species of grubs are more difficult to control than others. In a laboratory study conducted at Cornell Univetsity, the relative activity of the grub insecticide Turcam (bendiocarb) was tested against three common grub species found in New York State (Figure 5). This product proved much less effective against European chafer grubs than against the other two grub species. Knowing which grub species you are dealing with will often lead to improved pest control. The rate of mortality for each grub species can also be measured, and is an indication of the specific lag time against each of those species for each insecticide used.

A laboratory study conducted at Cornell University showed significant differences in the activity of several turfgrass insecticides against third instar Japanese beetle grubs (14 days post-treatment) in differing California soils. Small laboratory arenas provided data on the interaction of five soils with four insecticides and a parasitic nematode. Larger arenas allowed us to simulate field-type applications of insecticide and to provide for more realistic mobility of insecticides and grubs in the soil profile. Five California collection sites were chosen, based on risk of Japanese beetle infestation. At all of these sites, turf, thatch, and weeds were scalped off the surface and shipped to the New York state Agricultural Experiment Station for soil analysis and grub bioassay. The Japanese beetle grubs were field-collected from a golf course rough in central New York.

Our initial evaluation of insecticide activity indicated that

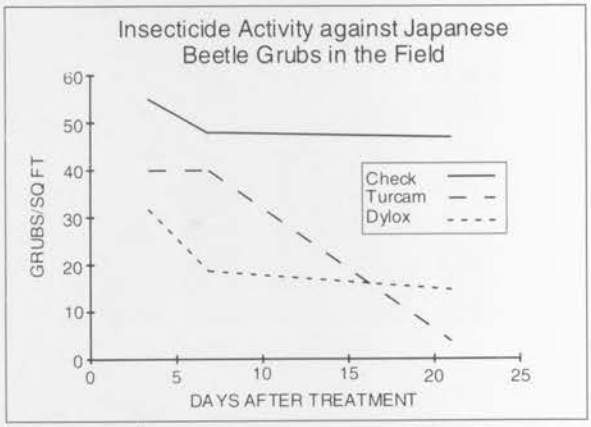

Figure 4. Field performance of Turcam and Dylox against Japanese beetle grubs. Villani, unpublished data 1992.

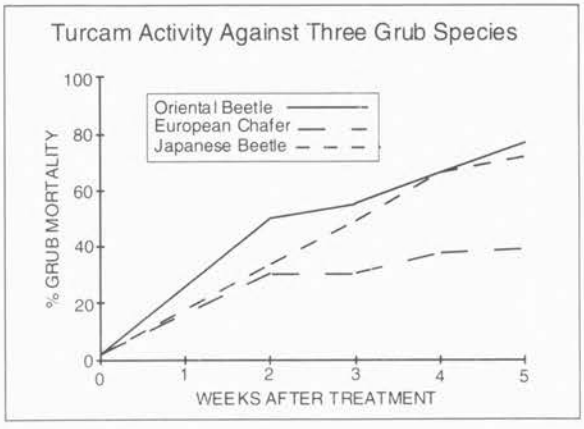

Figure 5. Relative activity of Turcam against three scarab grub species. Adapted from Villani and Wright. 1988.

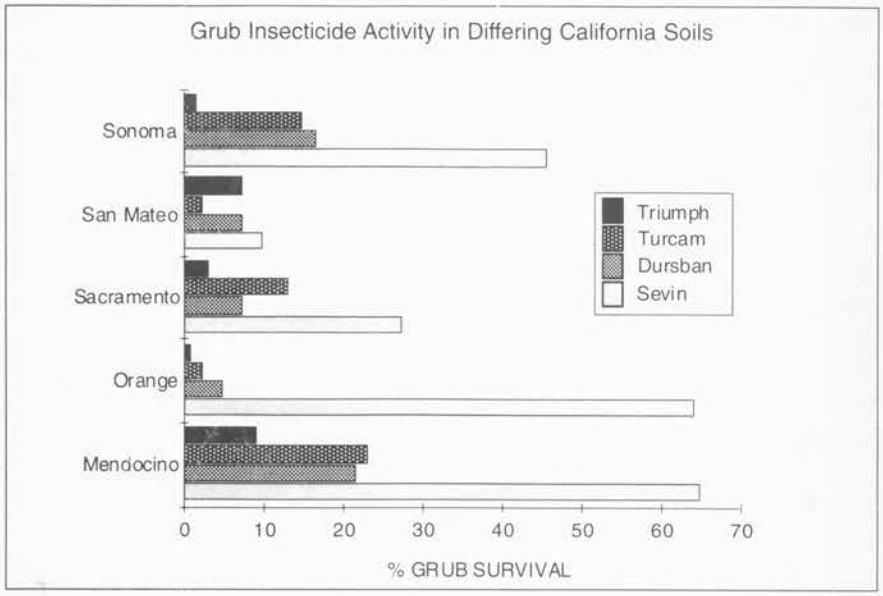

Figure 6. Results of Cornell University study that evaluated the performance of labeled turfgrass insecticides to control third instar Japanese beetle grubs in five California soils. Adapted from Cowles and Villani 1994.

the various insecticides differed in activity across soil types. It also indicated that soil-related factors accounted for significant differences in activity of all insecticides from one soil to another. Figure 6 shows how three of these factors compared in each of the five soils.

Regardless of the soil in question, there were clear differences in the grub-controlling performance of the several insecticides. Triumph proved the most effective and Sevin the least effective in this particular study. Remember, an insecticide may not provide acceptable control of an insect pest, even where environmental conditions for insecticide performance are ideal. For all insecticides tested, however, grub survival was much poorer in some soils than in others. The performance of all insecticides in the Mendocino soil was generally poor; the performance of all in the San Mateo soil was significantly better.

Standard soil testing procedures were employed to help determine the contribution of specific soil properties to the differing activity of the insecticides in differing soils. The variables examined included soil pH, water holding capacity (soil with low water holding capacity tends to allow more rapid movement of water into the soil profile), and percent organic matter (Figure 7).

Observed pH ranged from a low of 5.43 for San Mateo (acidic) to a high of 7.47 for Orange (neutral/basic). Water holding capacity ranged from a low of 2.98 for San Mateo to a high of 3.62 for Mendocino. Percent organic matter ranged from a low of 2.43 for Orange to a high of 10.07 for Mendocino.

Taken together, these variations help us begin to understand how specific soil properties can interact to cause performance differences in insecticides in field soils. It is also possible to determine how individual soil properties, taken separately, affected grub mortality and contributes to the overall performance of a given insecticide in a given soil.

An example is our determination of the impact of soil pH on the activity of Sevin (carbaryl) against Japanese beetle grubs (Figure 8). As soil pH increased (became more basic) the percent of grub mortality decreased. One factor in this equation, the impact of pH on the residual activity of Sevin, is shown in Figure 3.

The impact of organic matter on the performance of bendiocarb (Turcam) and chlorpyrifos (Dursban) against Japanese beetle grubs was determined in a similar way. Grub mortality decreased as the percent organic matter in the soils increased (Figure 9). Percent grub mortality averaged 96% for Turcam and 94% for Dursban when soil organic matter was low (about 3%) but dropped to 75% for Turcam and 80% for Dursban when soil organic matter rose to 10%. The discussion above on the impact of soil organic matter explained this by noting that organic matter in the soil will bind with insecticides, making the insecticide molecules unavailable for grub control.

The impact of two simulated irrigation regimes on the activity against Japanese beetle stubs of two turfgrass insecticides and an entomogenous nematode (S. glaseri) was also determined (Figure 10). In each treatment, grub

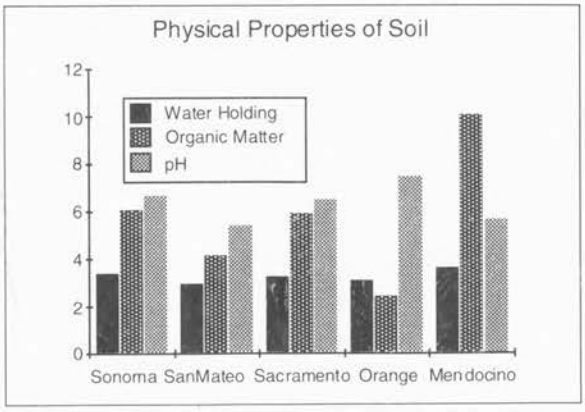

Figure 7. Determination of the water holding capacity, percent organic matter and pH of soils in California study. Adapted from Cowles and Villani 1994.

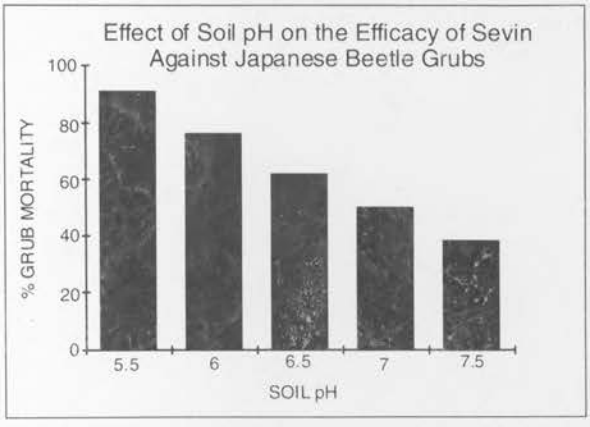

Figure 8. Results of regression analysis to determine the effect of soil pH on the performance of Sevin based on California study. Adapted from Cowles and Villani 1994.

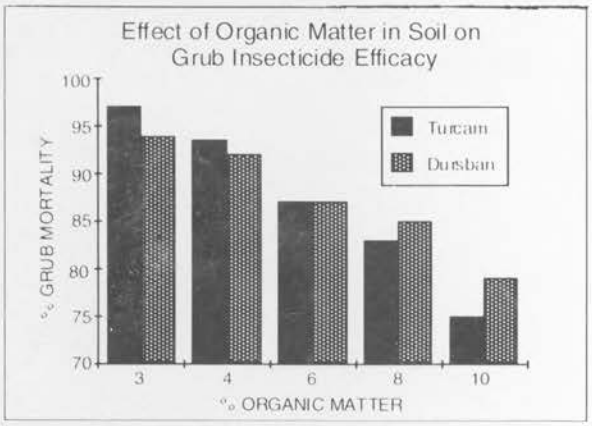

Figure 9. Results of regression analysis to determine the effect of soil organic matter content on the activity of Turcam and Dursban. Adapted from Cowles and Villani 1994.

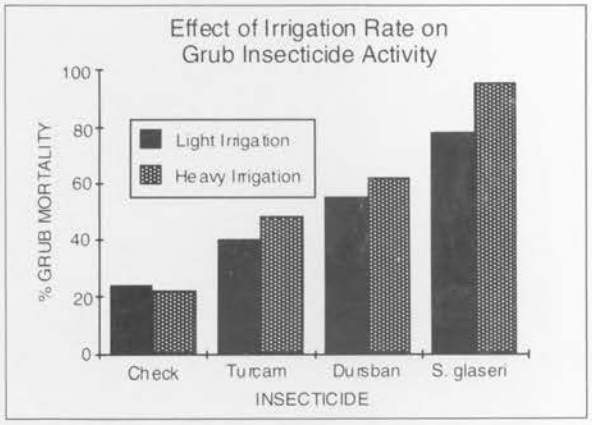

Figure 10. Impact of irrigation on the performance of turfgrass insecticides. Adapted from Cowles and Villani 1994.

mortality was higher at the higher irrigation level (1 in. equivalent) than in the lower irrigation regime (1/8 in. equivalent). Improved insecticide activity at the higher irrigation rate can be assumed to be the result of better overlap of insecticides and grubs -- i.e., deeper penetration of insecticides -- in the soil profile. This improved overlap can be due to increased movement of control agents down into the root zone, movement of grubs up to the thatch/soil interface, and increased grub feeding at the interface.

Conclusions

As is very often the case, carefully controlled laboratory research has reinforced the observations of turfgrass managers that environmental factors such as temperature and rainfall, and soil factors such as pH, percent organic matter, and water holding capacity influence the performance of soil insecticides in controlling scarab grubs. Specific properties of insecticides, such as characteristic lag time, affinity to thatch, and solubiliy then reduce or compound the effects of these environmental conditions.

Dr. Michael G. Villani is an associate Professor of Soil Insect Ecology in the Department of Emomology ar NYSAES/Cornell University. He has degrees from the State Universiry of New York at Stony Brook and -- in entomology -- from North Carolina State University. Dr. Villani, who is active in both research and extension work, concentrates on the interrelationships between soil insects, their host plants, and the soil environment. His most recent contribution to *Turgrass TRENDS* appeared in the June 1995 issue.

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Villani, M.G. and R.J. Wright. 1988. Use of radiography in behavioral studies of turfgrass-infesting scarab grub species (Coleoptera: Scarabaeidae). *Bull. Entomol. Sco. Am.* 34(3): 132-144.

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Tashiro, H. 1987. *Turfgrass Insects of The United States and Canada.* Comstock Pub. Associates, Ithaca, N.Y. (ISBN: 0801418143).

GDGCSA Member Receives Personal Certification

Richard M. Kaiser, superintendent at Paint Creek Country Club, has been designated a Certified Golf Course Superintendent (CGCS) by the Golf Course Superintendents Association of America.

To become certified, a candidate must have five years experience as a golf course superintendent, be employed in that capacity and meet specific educational requirements of college credit or continuing educational units. The candidate must then pass an extensive six-hour examination covering all aspects of golf course management.

As part of the certification process, it is required that two certified superintendents inspect the candidate's facility. The attestors for Rich were Mark Jackson, CGCS of The Country Club of Detroit and Marty Miller, CGCS of Cherry Creek Golf Club.

GCSAA instituted the certification program in 1971 to recognize outstanding and progressive superintendents. More than 1,600 active GCSM members currently hold "CGCS" status.

BIG EVENT!

The Cutting Edge

by Stu Cavender

As the Outdoor maintenance season comes to an end, everyone begins their winter projects around their facilities. Not the least of which, is the maintenance and reconditioning of the equipment used all summer long. We know that the reels need to be ground, that old rotary mower needs the engine rebuilt, and that one greensmower just has to be replaced. But very often we overlook the need to maintain the sweepers, blowers, aerators, and the spray unit that has something wrong with it every spring. These units get used sparingly throughout the season and require less maintenance. However, proper winterization is critical for all of these machines, especially for the spray units. Following are some steps to follow when winterizing a spray machine. When doing so, remember to inspect the entire machine for any signs of wear. Replace any worn or damaged parts.

TRACTION UNIT:

1. Thoroughly clean the traction unit and engine.
2. Check the tire pressure.
3. Check all fasteners for looseness; tighten as necessary.
4. Grease or oil all grease fittings and pivot points. Wipe up any excess lubricant.
5. Lightly sand and use touch-up paint on painted areas that are scratched, chipped or rusted.
6. Service the battery and cables as follows:
   A) Remove the battery terminals from the battery posts.
   B) Clean the battery, terminals, and posts with a wire brush and baking soda solution.
   C) Coat the cable terminals and battery posts with petroleum jelly to prevent corrosion.
   D) Slowly recharge the battery every 60 days for 24 hours to prevent lead sulfilrizing of the battery.

ENGINE:

1. Drain the crankcase completely, and refill with recommended engine oil
2. Run engine until completely out of gasoline, then restart and run on unleaded gasoline mixed with stabilizer for at least 10 minutes.
3. Check coolant protection.
4. Disconnect and remove battery.
5. Clean exterior surface of engine.
6. Leave spark plugs in holes or seal spark plug holes with suitable threaded metal plugs.
7. Seal all openings in engine and accessories with weatherproof tape. Mask off all areas used for electrical contact.
8. Make sure all surfaces are dry, including ignition wiring, and all exterior surfaces of engine.
9. Thoroughly clean and service the air cleaner assembly.
10. Check the oil filter cap, gas cap, and radiator cap to ensure they are all securely in place.

(continued on following page)

The Cutting Edge *(continued)*

SPRAYING SYSTEM:

1. Flush pump and entire spraying system with water and tank cleaning agent. Drain pump and spray system completely. If using granule agents it may be necessary to remove and disassemble components in order to satisfactorily clean then.
2. Add a rust inhibiting antifreeze solution to the pump and recirculate through the system, coating the pump interior. Drain solution completely.
3. Remove coil assemblies from solenoid valves. Apply a light film of petroleum jelly or equivalent to the armatures. Reinstall coil assemblies on solenoid valves.
4. Check condition of spray hoses. Tighten all hose connections securely.
5. Lubricate boom pivot grease fittings and pivot points.

All makes and models of sprayers provide specific details on storing or winterizing that specific machine. These details are usually found in the Operators/Owners Manual. Remember, proper wtnterizatlon of your equipment will lead to a smooth transition into the following spring.

SUPERINTENDENT'S NOTICE

Do you write a column for your club's newsletter? If so, please consider contributing it, or a portion thereof, to a *Patch of Green* for publication. There is sure to be some good information which you could pass along to your fellow superintendents. Please, share your knowledge and experiences. It helps everyone! Oh, by the way, any such column contributed will qualify for consideration for the John Walters Award.

Rick Murphy, *Awards Chairman*

Board Meeting
Knollwood Country Club
Wednesday, July 24, 1996

Finance (Szyndlar)
Checking - $27.47
Savings - $19,057.86
Foundation- $17,282.68

Membership (Jones)
Membership 406. Applications approved - 1

Editorial (Dorner)
Camera to be purchased for *A Patch of Green.*

Awards (Murphy)
Kolbe and Murphy working on presentation for Glossinger at the August 8 meeting.
Heritage Award - Mailing to be sent out late August.

Clothing (Murphy)
Awaiting shipment of inventory for Aug. meeting.

Education (Hock)
Meeting August 8 at Bay Pte. Glossinger to present slides and do Q&A on U.S. Open.
Meeting Sept. 16 at Lakelands to be a Supt/Club Official Only

U.S. Open (Dushane)
Sent gift certificates to Peter and Gay Jackson for hosting the Hospitality tent.

Picnic (Murphy)
Have received reservations for 50.

Name Tags (E.S.)
Name tags distributed to Board Members.

Golf Day (McKinley)
Committee: Hock, McKinley, Bay, Cyr, Palm
Sites: Bay Pte., Forest Lake, Red Run, Tam O'Shanter
Entry fee: $125.00. Includes Raffle Ticket and entry into Closest-to-Pin Contest and $60.00 donation.

'97 Dues (E.S.)
'97 dues statements to go out by August 15, reflecting the increase of $10/member.

E.S. Contract (Dushane)
Present 3-year contract with Mason Wordprocessing expires Dec. 31, 1996. Executive Board will meet with E.S. and make recommendation to the Board.

Board Meeting
Knollwood Country Club
Wednesday, August 28, 1996

Finance (Szyndlar)
Checking - $1,131.43
Savings- $19,122.79
Foundation - $3,005.78

Membership (Jones)
Membership 410. Applications approved - 3

Editorial (Dorner)
Fall issue to go out Sept. 27. Winter issue to be a resource issue. All Michigan Assn. vendor members will be solicited to be included in the resource issue. Camera purchased for *A Patch of Green.*

Education (Hock)
Disappointed with poor attendance at the August meeting (35). Encouraged Board to bring foursome of club officials to the Sept. meeting.

Golf Day (Hock/McKinley)
Sponsors and Supts. are responding with donations of money & golf packages. Flyer to go out to list of 750 (including members) by Sept. 1. Board members committed to helping with check-in, etc. at participating sites.

'97 Dues (E.S.)
Only 25 members have paid their dues as of this date. Final notice will go out by Sept.15. Due by Oct. 1.

E.S. Contract (Dushane)
Proposal for new 2-year contract will be presented at the Sept. Board Meeting.

'97 Hospitality Room (McKinley)
Dates: Feb. 8, 9 and 10

Changes To Your Roster:

BOKSA, OLIVER
CLASS CHANGE FROM
AFFILIATE TO B
Bonnie Brook Golf Club
19990 Shiawassee
Detroit, MI 48219
0-(313) 534-2830, ext. 212

DONOHUE, DAN
ADDRESS CHANGE
22990 Whitehall Dr.
Novi, MI 48374-3646

GRAY, JOHN (Pg.41)
ADDRESS CHANGE
06551 Bayshore West
Charlevoix, MI 49720

LA FONTAINE, GORDON
(Pg.47)
H-(517) 366-6715
0-(517) 366-7726

New Member Roster

BANYAI, BRIAN
CLASS C
Glacier Club
39015 Barth
Romulus, MI 48174
H-(313) 941-5216
0-(810) 781-3148
FAX (810) 781-3725

HUGHES, THOMAS
CLASS C
Links at Pinewood
8600 PGA Drive
Walled Lake, MI 48390
H-(810) 673-8214
0-(810) 669-7152

LINDERMAN, JACK
(MARLA)
CLASS C
Polo Fields Golf & C.C.
5150 W. Liberty Rd.
Ann Arbor, MI 48103
H-(313) 669-8219
0-(313) 913-0888
FAX (313) 998-1092

LONCAR, ANNE
(WILLIAM)
CLASS B
Indian Springs Metropark
6026 Long Point
Davisburg, MI 48350
H-(810) 625-6326
0-(810) 625-7625
FAX (810) 625-6639

NIEMI, THOMAS
CLASS B
Wheatfield Valley Golf Club
5864 Lochleven
Waterford, MI 48327
H-(810) 674-0089
0-(810) 632-5663

SCHAEFER, MICHAEL
(COLLEEN)
CLASS A
Hartland Glen Golf Course
12400 Highland
Hartland, MI 48353
H-(810) 632-5130
0-(810) 632-5663
FAX (810) 887-0336

Greater Detroit GCSA
1996 Calendar

October 7	Turfgrass Fund Raiser	Bay Pointe GC
	"The Big Event"	Forest Lake CC
		Red Run GC
		Tam O'Shanter CC
October 22	Annual Meeting	Maple Lane GC
November	GCSAA Seminar Topic: Preventative Maintenance of Turf Equiment	TBD
December	Superintendents Only	Birmingham CC
December 6	Xmas Party	Cherry Creek GC

Mid-Michigan Turf Association
1996 Schedule

October 7 (Monday)	Fall Fund Raiser Warwick Hills, Grand Blanc
October 22 (Tuesday)	Annual Meeting - TBA
December 14 (Saturday)	Christmas Party Frankenmuth

Northern Michigan Turf Managers Association
1996 Meeting Schedule

October	Boyne Highlands, Harbor Springs NMTMA Annual Meeting & Tuck Tate Championship

GREATER DETROIT GOLF COURSE SUPERINTENDENTS ASSOCIATION

P.O. BOX 173 • TROY, MICHIGAN 48099 • TEL (810) 362-1108 • FAX (810) 362-1736

APPLICATION FOR MEMBERSHIP

I hereby apply for membership in the Greater Detroit Golf Course Superintendents Association, which is an Affiliate Chapter of the Golf Course Superintendents Association of America.

Name:	Spouse:	
Home Address:		
City:	State:	Zip:
Business/Club:		
Business Address:		
City:	State:	Zip:
Mailing Address: (Check One)	_____ Home	_____ Business
Home Phone:	Office Phone:	Fax:
Are you a GCSAA member?:	Are you a CGCS (Certified Supt.)?	

PRESENT POSITION

Title of Current Position:
Starting Date of Current Position:

PAST POSITIONS HELD

From/To	Title	Place of Employment	City/State

Each application must be signed (attested) by two members (SUPERINTENDENTS) of GDGCSA, who certify as to the reliability of the applicant's information as stated above.

Attestor:	Date:
Attestor:	Date:

If accepted, I hereby certify that I will observe the constitution and by-laws of the Greater Detroit Golf Course Superintendents Association and the Code of Ethics of the Golf Course Superintendents Association of America.

Signature of Applicant:	Date:

Do not include a check with this application

FOR GDGCSA USE ONLY

Date Application Rec'd:		Date Approved:
Amt. Due:	Date Paid:	Check No:
Class:		Membership No.:
Signature (Membership Chairman):		

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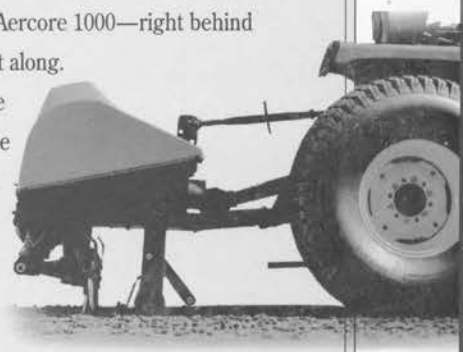

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