WESTERN MICHIGAN GOLF COURSE SUPERINTENDENTS ASSOCIATION

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

Western Views

July/August 1987

PRESIDENTS MESSAGE
Kurt A. Thuemmel C.G.C.S.

After a long, dry period, we are beginning to receive some much needed rain. Remember the good old days when we would receive a good "all day" soaker that would wet the entire soil profile? So far this year, the rains that have transpired in the Lansing area are short and heavy or the type that wash much of the sand off the bunker faces. Oh well, it could be worse (Fall of '86). At least our roughs are beginning to green up with the periodic rains.

The June meeting was held at Riverside Country Club on the 22nd with Alex Clarkston as our host. We had a good turnout, and thanks to Alex, we were able to play on a well-maintained golf course. Our next meeting will be August 3rd, with Paul Schippers as our host, at the Moors Golf Club near Portage. A notice will be out by the time you receive this newsletter.

You should have received a flyer on the annual golf day fundraiser at the Coutry Club of Jackson with Bill Madigan as host. The alternate club is Arbor Hills where Jim Eccleton is the superintendent. Don't delay, send in your application now and insure your spot in this important fun-filled day. The proceeds are used to help support ongoing Turfgrass research at Michigan State University.

Kurt Thuemmel

1987 WMGCSA OFFICERS

Kurt Thuemmel C.G.C.S. ..... President
Walnut Hills Country Club, E. Lansing, Michigan
517/332-6060

Roger Barton ..... Vice-President
Blythefield Country Club, Belmont, Michigan
616/363-5945

Chris Fochtman ..... Secretary-Treasurer
Greenridge C.C., 740 Greenridge Dr., N.W., Grand Rapids, MI
616/784-6597

Keith Paterson, C.G.C.S. ..... Past President
Kent Country Club, Grand Rapids, Michigan
616/363-6728

Directors

Pete Ashe, C.G.C.S.
Hillsdale C.C., Hillsdale, MI
517/437-7861

Bill Davis
Marywood C.C., Battle Creek, MI
616/962-9784

Jeff Gorney, C.G.C.S.
Grand Rapids Elks C.C., Grand Rapids, MI
616/453-0705

Bob Hope, C.G.C.S.
Kalamazoo C.C., Kalamazoo, MI
616/343-2895

Bob Johnson
Forest Hills Golf Club, Grand Rapids, MI

Fred Pastoor
Muskegon C.C., Muskegon, MI
616/759-0694

Editorial Committee

Chairman-Advertising ..... Keith Paterson C.G.C.S.
Kent C.C. - 616/363-6728

Photographer ..... Charlie Scott
616/731-4148

Bill Madigan C.G.C.S., C.C. of Jackson - 517/787-0650

Kurt Thuemmel C.G.C.S., Walnut Hills C.C. - 517/332-6060

Advertisers

Please patronize them as they have made this newsletter possible.

Arthur Hills & Associates
Benham Chemical
C & R Grinding
Century Rain Aid
Ellis Sales
Grand Rapids Tree
Ideal Mower
Kubota of Grand Rapids
Lawn Equipment
LESCO
Matthews & Associates
Miller West
J. Mollema & Sons
Nor-Am Chemical
O.M. Scott
Parmenter & Andre
Raymer Pump
Rhone-Poulenc
Soderstrum Irrigation
Spartan Distributors
Spring Valley
Standard Sand
Turf Chemical
Turfgrass Products

MEETING SCHEDULE

Aug. 31	Golf Day Jackson C.C./Arbor Hills C.C.
Sept. 28	C.C. of Lansing Annual Meeting
Nov. 7	Fall Party Cascade Hills C.C.

HEALTHFUL SUGGESTIONS

by Paul Richter, Spring Lake C.C.

As golf course superintendents we do a fine job providing our members with fine playing conditions. However, our jobs, in the warm months of the year, are very time consuming, and we find it difficult to regularly exercise to keep ourselves in good physical condition. With many demands on our time from work and family, working a regular exercise program into our lives is difficult. But every person does need to work their heart and lungs occasionally and make some form of physical fitness a part of daily life. Two of the easiest exercises to incorporate into your daily activities, and that do not require much extra time away from the job and family, are walking and bicycling.

Walking does not require the purchase of any equipment and can be easily incorporated into daily activities. When playing golf, walk - this is an obvious one. Walk 9 to 18 holes of the golf course as part of your daily routine and check the course for problems as you go. Go for a walk after dinner and take your wife; it will help you to digest your food and the day's events. Even walk to work, the store, or where ever else - use your imagination.

The bicycle is something we all enjoyed as a youngster, but as soon as those ol' car keys are in your pocket, the bike is in the corner collecting dust and rust. This form of 2-wheel transporation and recreation can easily be incorporated into your daily lifestyle. There is an initial expense for this exercise; a couple hundred dollars for a bike, another $30 to $50 for accessories, (rack, light, pump, bags, etc. . .)and you have a very versatile piece of equipment. After this cost, with a little planning and imagination, the bicycle can be used for many duties that the automobile is used for.

If you live close enough to work, 5 to 10 miles, with a little planning for clothes, you can commute on your bike. It will be surprising to find how fast you can travel to work, especially if you live in a busy city. Even if you travel at 10 mph you can make a 5 mile trip in 30 minutes, and most people can ride at 13-15 mph with little effort. For example: I would ride about 12 miles one-way to work in 40-45 minutes. It would take me 20-25 minutes or more in heavy traffic to drive, roughly twice the time by bike. However, in the morning you wake up and feel more mentally alert when you arrive, and in the afternoon you are not sitting in a hot car, going nowhere, in heavy traffic, getting high blood pressure; you are in the fresh air, exercising, strengthening your heart and lungs.

Errands can also be done on the bike; go to the bank, barber, hardware store, even the party store for six chilly ones. Of course you can't carry a week's worth of groceries, but many small items will fit into the saddlebags used to bring lunch and other items to work. Even ride to the tennis courts, swimming pool, or to meet the boys for a couple at your favorite watering hole. (Not many people are arrested for riding a bicycle under the influence).

Include the family by taking the kids in tow for a little ride after work; they'll love it. It's good exercise and you are able to spend some time with them doing something everyone can enjoy. If a park is near you, pack a lunch and ride with the family to the park for a picnic.

The main point is that your are getting some exercise without taking much time away from your normal busy daily activities by incorporating exercise into your day. With a little imagination and planning, you can work a little exercise into everyday and take a step in keeping yourself in good physical condition.

PESTICIDE RINSE WATER DISPOSAL OPTIONS

by K.W. Brown
Texas Agricultural Experiment Station
Texas A & M University

Recent Federal legislation has resulted in the classification of anyone who has more than 100 kg (200 lbs. or 30 gallons) of pesticide solution or rinse water to dispose of each month as a hazardous waste generator.

The reauthorization of the Resource Conservation and Recovery Act PL 98-6 includes a provision that such wastes must be treated as hazardous waste and must be stored and disposed of only by approved methods. Since many of the commonly used pesticides are on the EPA list of toxic substances, all surplus spray solutions, container rinsate water, spray equipment rinsate, solutions resulting from spill cleanup, and misformulated solutions are hazardous wastes and must be dealt with accordingly. Thus, nearly everyone who does a significant amount of spraying, including those involved in grounds maintenance, golf course management, nursery operaton, aerial applications, Agricultural Experiment Stations, and turfgrass or landscape maintenance operations, will need to find safe, economical, and approved methods of reducing the amount of waste they generate and disposal methods for the remainder. In the past, the common practice has been to wash the excess spray and rinse water down the drain into the sewer or allow it to run off into adjacent drainage ways. In some states, notably California, some operators were encouraged to install soil lined pits or disposal mounds similar to those used for septic tank effluent. These practices will now likely be banned or abandoned because of the adverse impact on the environment when the pesticides flow or leak from such systems into surface or underground water resources.

What Can Be Done?

There are several things that can be done to reduce the amount of waste. First of all, care should be taken to mix only the amount of pesticide which is needed so that there is little excess. Empty pesticide containers must be triple rinsed before disposal. The best approach to this is to use this rinse water to make up the pesticide solution being prepared. Another approach to reduce the volume that needs to be dealt with is to have areas available where any excess mixed pesticides can be applied at the recommended rates. It may even be possible to add rinse water to the spray apparatus after it is empty and to spray that over an appropriate field, thus rinsing the apparatus and simultaneously disposing of the rinse water. Care must be taken, however, not to exceed recommended application rates.

Several manufacturers, e.g., Ag Robotics of Childress, Texas, are now developing metered injection devices, which add the pesticide to the stream of water just behind the spray nozzle. The system allows the concentrated pesticides to be kept in small chambers, while the make-up water is transported in a large container that does not need to be rinsed. While these systems will be used increasingly in the future, they are more complex and thus, more expensive than conventional spray apparatus. D.L. Richards and T.L. Ladd have written an article on pesticide injection published in the Transactions of the American Society of Agricultural Engineers (V 26, 1985, pp. 683-686) which gives more details on recent advances.

It may also be possible to collect the excess solution and the rinse water and hold it in tanks to be used as make-up water when the next solution is made. Such an approach is difficult, however, when a variety of pesticides is used. In addition, there is no way to know how much residue is in the solution being stored, thus interfering with accurate formulation. Microbes are likely to grow in the stored solution, producing slime that may plug spray systems.

Even if one or more of these approaches is implemented, there are likely to be small quantities of pesticide solutions and rinse water that will need to be disposed of. Once the solutions are collected, they may be containerized, perhaps in Department of Transportation approved 55-gallon barrels, and shipped to EPA approved disposal facilties. The cost is typically $250 per barrel, which is far too expensive for many operators to support.

A second disposal option is to filter the solution to remove suspended solids by running it through an absorption media, such as activated charcoal. While there is some data on activated charcoal, there are no comprehensive studies available which would indicate how a filter would respond to the mixture of pesticides that are likely to occur. Absorption columns would need to contain several hundred pounds of charcoal, and frequent

(Continued on Page 5)

(Continued from Page 4)

tests of effluent would be needed to assure that the absorption capacity has not been exceeded. Once such filters are saturated, they would likely need to be disposed of in EPA approved hazardous waste facilities. Thus, this option is also likely to be very expensive, since one must purchase and later dispose of the filter material, in addition to conducting repeated analysis of effluent, which typically costs $500 per sample.

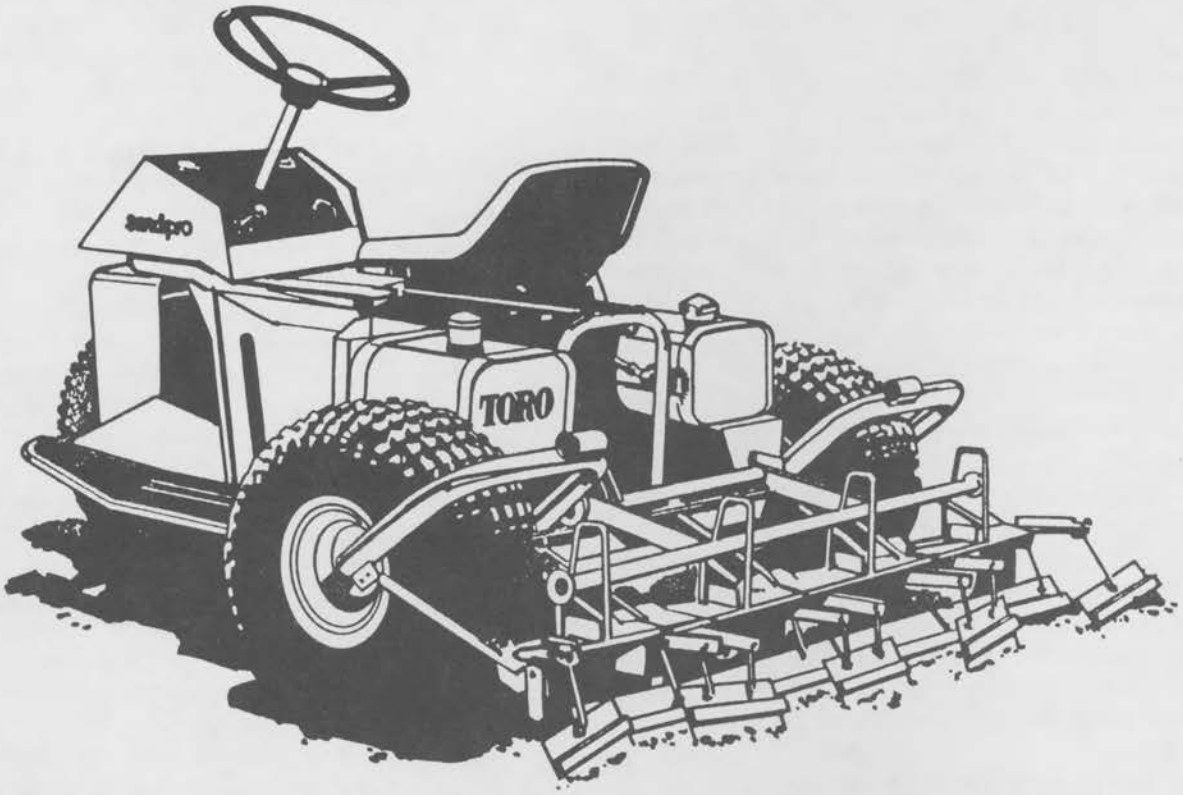
Since the major component of the waste is water and since the pesticides in use today are degraded by soil microorganisms, evaporativee pits or enclosed soil disposal beds may be considered. However, any system that is in contact with the soil surface such that leaks cannot be observed will need to be monitored by wells drilled to the water table to demonstrate that the pesticides are not migrating to the groundwater. Even the use of concrete, metal, or plastic lined pits or soil beds does not eliminate the need for as many as four groundwater monitoring wells for each facility when the bed or pit is in contact with the soil. In addition to the cost of serveral thousand dollars to install each well, samples will need to be collected and analayzed for pesticides, likely quarterly at costs similar to those described above. Thus, this system is also likely to be very expensive.

Several other possibilities exist which have not been fully explored or developed. These include small scale waste water treatment plants, which may require carefully selected micro-organisms to degrade the pesticides, and ultraviolet light treatments or chemical treatments, which would destroy the active ingredients of the pesticide formulation. While these approaches are each effective for selected pesticides, no information is available on how effective these treatments would be for the diverse mixtures of pesticides that must often be handled.

A final option, which may be feasible, is to use an enclosed bed of soil in a container above the soil surface to evaporate and degrade the pesticide. Containerized soild disposal systems have been used with success at the Iowa State University Research Farm for over a decade. Junk and Richards (1984) report that some 144 kg of active ingredients of pesticides had been applied to a 100 m $\pm$ plot in a two year period without significant residue build-up. They also tested vapor concentration in the air above the facility and reported most pesticides were below detection levels, likely indicating that they were being degraded rather than vaporized. The Iowa system consists of a concrete lined pit and a mechanically activated roof, which covers the soil during precipitation events to exclude rain water. Thus, there is some evidence that such a system may be used to evaporate pesticide solution and degrade the residues. Unfortunately, as pointed out above, in-the-ground systems will require monitoring wells. Thus, it is suggested that another option would be to assemble a similar system in above ground containers. The ideal system would consist of a covered concrete slab equipped with a drainage system to collect spill, rinse water, and ash water in a sump. The collected waste would be pumped into a specially designed tank which has a lower liquid storage container and an upper layer of soil. The tank would need to be constructed of materials that are resistant to the waste and possess sufficient strength to maintain structural integrity and minimize the potential for leaks. For the present, coated metal tanks offer the best alternative. While the size of the liquid storage volume and soil evaporative surface vary depending on the climate and the volume of waste to be treated, a typical tank would contain 1 m (three feet) deep liquid storage chamber with 30 cm (12 inches) deep layer of carefully selected soil suspended above it on a perforated floor. A sump pump woudl be used to apply daily doses of the accumulated liquid to the soil via a surface distribution system. Rectangular tanks could conveniently be made from 1.2 by 2.4m (4 by 8 ft.) sheets of plate metal in units which are 1.2 by 2.4, 2.4 by 2.4, 3.7 by 2.4, and 4.9 by 2.4 m (4 by 8, 8 by 8, 12 by 8, 16 by 8) or larger if necessary. They will need to be supported at least 20 cm (8 in.) above the ground to facilitate visual inspection for leaks and to eliminate the need for ground water monitoring wells and associated sampling and analysis. This could be done by constructing the tanks on skids and placing them on blocks. While moveable covers would be ideal, a more practical solution would be to use a stationary fiberglass roof, which would allow radiation to evaporate the water but eliminate precipitation. With proper construction and maintenance, a soil digester as described above should be useful for several decades. If the experience in Iowa is borne out, the soil will be sufficiently decontaminated in perhaps one or two years after use ceases to allow disposal by simply spreading it on an adjacent field, or if it must be treated as a hazardous material, its volume will be much smaller than that of the pesticides that were disposed of.

While there is obviously still more to be learned, it appears that above the ground soil disposal beds may provide an environmentally sage and economical means of pesticide solution rinse and wash water disposal. The author is presently constructing several systems as described here for further testing.

Sand Pro®
The Professional for performance.



The Toro® Sand Pro® is the only sand trap rake with total hydraulic power. That means lower maintenance, longer life and superior performance. The Sand Pro® maneuvers completely around in its own length for raking traps and tight "peninsulas." Hydraulic motors on all wheels, with no gears or belts to maintain.

Attachments make the Sand Pro® even more useful. Options include spiker, finish-grader, edger and drag mat.

SPARTAN DISTRIBUTORS, INC.
SPARTA, MI 49345
PH: (616) 887-7301

TORO®

THE PROFESSIONALS THAT KEEP YOU CUTTING.

EFFECTS OF SPRAY TANKS WATER pH ON PESTICIDE EFFICACY

C.S. Gorsuch and R.P. Griffin, Extension Entomologists
Clemson University

In recent years we have noticed several cases where a given insecticide will give excellent control in one location and very poor control in a nearby location. The first thing that we tend to think of is that the insects are becoming resistant to the material or that there has been a problem in application or calibration. Many growers will blame the insecticide. A key factor that is usually overlooked is the pH of the spray water.

Most modern pesticides, especially the organophosphate, are compound molecules that break easily into two or more inactive, smaller molecules when exposed to extremes of pH.

A survey of 12 ponds in the Coastal Plains of South Carolina showed an average pH of 8.2 (range 6.8 - 9.5). Five wells were sampled throughout the state and these had an average pH of 6.7 (range 4.5-8.0). City water from Charleston, Conway and Clemson had an average pH of 7.9 (range 7.5-8.3).

The following table shows the effects of pH on the hydrolysis rate of selected pesticides.

INSECTICIDES		
CYGON dimethoate	pH 2.0	½ life = 21 hours
	pH 6.0	12 hours
	pH 9.0	0.8 hour
DIAZINON diazinon	pH 5.0	½ life = 2 weeks
	pH 6.0	8 weeks
	pH 7.0	10 weeks
	pH 8.0	8 weeks
DYLOX/PROXOL trichlorfon	pH 6.0	½ life = 3.7 days
	pH 7.0	6.5 hours
	pH 8.0	63 minutes
FURADAN carbofuran	Unstable under alkaline conditions	
IMIDAN phosmet	pH 4.5	½ life = 13 days
	pH 7.4 (20 C)	7.1 hours
	pH 7.4 (38 C)	1.1 hours
	pH 7.0	< 12 hours
	pH 8.3	< 4 hours
MALATHION malathion	Stable at pH 5.0-7.0 but rapid hydrolysis in more acidic or alkaline solutions	
LANNATE/NUDRIN methomyl	Stable only in slightly acid water.	
LORSBAN/DURSBAN chlorpyrifos	pH 7.0	½ life = 35 days
	pH 8.0	1.5 days
SEVIN carbaryl	pH 6.0	½ life = 100-150 days
	pH 7.0	24-30 days
	pH 8.0	2-3 days
	pH 9.0	24 hours
GUTHION azinphosmethyl	pH 5.0	½ life = 17.3 days
	pH 7.0	10 days
	pH 9.0	12 hours
DIMECRON phosphamidon	pH 4.0	½ life = 74 days
PHOSPHAMIDON	pH 7.0	13.5 days
MAVRIK fluvalinate	pH 3.0 (25 C)	½ life = > 30 days
	pH 3.0 (42 C)	35 days
	pH 6.0 (25 C)	> 30 days
	pH 6.0 (42 C)	8 days
	pH 9.0 (25 C)	1-2 days
	pH 9.0 (42 C)	< 1 day
TURCAM/FICAM bendiocarb	If water pH is greater than 8, add a commercial buffering agent to adjust water pH to 7 or less. The activity of Turcam/Ficam at pH 8 or greater may be reduced.	
ORTHENE acephate	pH 3.0 (21 C)	½ life = 66 days
	pH 3.0 (40 C)	29 days
	pH 5.0 (21 C)	55 days
	pH 5.0 (40 C)	30 days
	pH 7.0 (21 C)	46 days
	pH 7.0 (40 C)	17 days
	pH 9.0 (21 C)	16 days
	pH 9.0 (40 C)	3 days
MONITOR methamidophos	pH 3.0 (21 C)	½ life = 22 days
	pH 3.0 (40 C)	8 days
	pH 5.0 (21 C)	108 days
	pH 5.0 (40 C)	45 days
	pH 7.0 (21 C)	44 days
	pH 7.0 (40 C)	10 days
	pH 9.0 (21 C)	9 days
	pH 9.0 (40 C)	5 days
MITICIDES		
CARZOL formetanate	pH 5.0	½ life = 4 days
	pH 7.0	14 hours
	pH 9.0	3 hours
FUNGICIDES		
CAPTAN captan	pH 4.0	½ life = 4 hours
	pH 5.2	10 hours
	pH 7.1	3 hours
	pH 8.2	10 minutes
	pH 10.0	2 minutes
BRAVO chlorothalonil	pH 6.0	½ life = 6.8 hours
DACONIL	pH 7.0	1.2 hours
BENLATE benomyl	pH 5.6	½ life = 30 hours
	pH 7.0	1 hour

(NOTE: Benomyl breaks down to MBC which is still an active material.)

It is also important to note that all pesticides are not affected the same by pH. Also, it is very important to note how temperature effects the rate of hydrolosis at a given pH.

The pH of the water used for mixing pesticides should always be checked prior to mixing. The ideal pH range is 5.5-6.5. If the water source is alkaline, add a buffering agent to the water prior to adding the pesticide. Several commerical buffering agents are available. However, common household vinegar has been successfully used in different buffering capacities. This means that each case will have to be dealt with on an individual basis. The tank mix should be applied immediately.

Credit: Carolinas Newsletter
May/June 1987

The Master Planning Process

Have you ever had a member come up to you and ask "Why did you build that tee there?" or, "Why did you plant that tree in that particular spot?" My favorite question is "Who gave you **permission** to do that?"

After many years of being asked questions like these by people whose attitudes ranged from calm to irate, I decided to approach the Club with the suggestion that a Master Plan be prepared. By doing a Master Plan, the guidelines would be established for all future construction and changes. A committee would be designated to work with an architect with the final approval to come from the Board of Directors and the membership. I first approached my Green Committee with the idea in 1983, but due to funding and other projects within the club, approval to begin on the Plan was not received until the spring of 1986.

The first step was to appoint a Master Plan Committee. The Board of Directors appointed the Green Chairman as Chairman of the Master Plan Committee. The Chairman then selected five people, representing a cross-section of the playing membership, to round out the committee. This group included a low handicapper, a lady golfer, an average range handicap (10-20), a senior golfer and Superintendent.

The next step was to contact the Society of Golf Course Architects for a list of architects. Upon receiving the list, it was my job to contact six architects selected by the Chairman and myself to see if they would be interested in our project and, if so, to schedule an interview. From the initial six architects selected, we were able to set appointments with four of them.

The committee met prior to the interview to establish a list of questions regarding procedures and cost factors. A list of desired changes in the golf course was based on comments and criticisms from the membership during the last five years. Goals were set on what we wanted to plan to accomplish, (i.e., rebuild all bunkers and tees, to improve playability of six to eight greens, plant massive number of trees, improve the general visual perception from the player's point of view, improve cart traffic flow, drainage and improve the driving range and practice area). Information supplied by the Society of Golf Course Architects helped us compile the list of questions to be asked of each architect.

The committee also created a budget to include Master Plan cost, visitation costs and construction costs once the project was underway. Because of budgeting, it was decided that each architect would provide his cost estimates for the Plan, visitations and basic phase costs throughout constuction.

All interviews were conducted during the day in order for the architect to see and learn as much about the course as possible. By interviewing during the day, all committee members were not able to attend each interview. The interview usually consisted of two members of the committee and myself. I spent the most time with each architect showing them the course and giving them information.

One note to be made is that Harbour Tree Golf Club is a Pete Dye design. Pete Dye, however, was not one of the architects interviewed. The club did not want to lose the Pete Dye look, so the architects were all told that new work and modifications had to blend well with Pete Dye construction and theory.

All interviews lasted approximately 90 minutes followed by or preceded by 3-4 hours on the golf course. We finished interviewing by the first week in April, 1986.

At this point in time, it was my responsibility to call and check job references of each of the architects. Also, late in August, one member of the committee and I went on the road to take a first hand look at work done by the architects we had interviewed. We looked specifically at green, tee and bunker construction. These three areas were to be the major parts of our Plan along with extensive tree planting.

As part of the interviews, each architect was to submit his recommendations for the course along with his proposal for the Master Plan.

After going through the interviews, checking references, both by phone and by on-site inspections, and going over each set of recommendations and proposals, the committee made a final decision determining which architect would be hired.

Some of the major factors involved in the descision were the architect's time to be spent on the job by himself and not an associate; his green, tee and bunker designs and construction technique; and his imagination. We notified all architects interviewed of our decision and met with the chosen architect to draw up a final proposal and a contract.

Once the contractors were signed, we got down to work. The architect and one of his associates came in for two days. We spent the time entirely on the golf course. They checked yardage, took photographs of each hole from many different points of view, checked property lines and soil compositions.

It was necessary to find a good, clear aerial photograph of the course. We were able to acquire a very clear and recent 1-inch to 200 foot scale photo to be used as a base drawing.

(Continued on Page 9)

(Continued from Page 8)

At the end of the two days, the architect met again with the committee. The committee re-emphasized what they were looking for and the architect went over some preliminary ideas. He also informed the committee that he felt it would take three to four drawings to accomplish the final drawing he would include all his ideas and we could keep, cut or modify from that point. We were told that the first drawing might appear fairly radical, but that it was just a starting point.

Three weeks later (mid-November) we received the preliminary drawings and proposals. The committee met to review the plans. After ten days and two meetings, we were able to come up with the things we liked, things we wanted to modify and the things we wanted to eliminate completely.

The architect came back in for one day. I spent more time on the golf course with him going over what had been decided in committee. Later in the day he met with the committee for more input and modified ideas. He was asked to do another drawing and to also give us a list of various construction costs in more detail (i.e., costs and breakdown of bunker, tee green and mound construction).

One week before Christmas we received our second drawing. Again, the committee met to review it. Suggestions and changes were noted. The time seemed right to get membership input. The drawing was placed in the clubhouse for three weeks with a suggestion box. During the three week period, there were many suggestions made and several questions asked.

The third week in January the committee met twice to review all suggestions and comments that had been made. Some of the suggestions were implemented and some more were completely discarded. Once this was completed, the committee established what they felt were final ideas for the Plan. The Chairman decided that the third drawing would be the final drawing. This was due basically to time considerations. He wanted to have the final drawing by mid-March.

The architect came again during the first week in February. We were blessed with very good weather and were able to spend the day on the course going over the final ideas. That night he met with the committee. He was told the basis of our decisions and why certain changes had been made. He also made some suggestions that were implemented at that time. His instructions were to do the final drawing and get it back for review as soon as possible. Once reviewed, we would move on to the next step of the of the project.

After approval of the plan, we began to establish phasing of the construction. Our goal is to complete that plan over a ten-year period. This will be based on economy and budgets. As part of the phasing procedures, the architect drew detailed hole by hole drawings of work and chain zones so that work will be confined to specific areas and not in many different areas simultaneously. Very detailed cost breakdowns and estimates are done for each individual project as well as for each phase.

A copy of the final drawing will go to a local irrigation designer to design a new irrigation system for the course. Irrigation changes will be made in each phase with a double row fairway system being installed during the last phase.

An important part of the Plan is the tree planting plan. A copy of the final Plan will go to a local landscaper who will assist with the planting program. He will help us with species and sizing selection and also availability of material. Tree planting will start in late September and continue on a yearly basis thereafter.

The final Plan includes rebuilding all bunkers, adding some waste area bunkers, resurfacing in bentgrass or rebuilding all tees, six greens modifications, complete redesign of one hole, contour mounding, two new greens, driving range modification, a new irrigation system, planting of 1,600 trees, cart paths, drainage and a new maintenance facility.

The committee has decided that all tee, bunker and green modification work will be done in house. All drainage, tree planting and mounds will also be done by my staff. The new greens, hole redesign, irrigation and cart path work will be contracted out. The architect is responsible for doing all project drawings and site layout and staking whether my staff or an outside contactor will be performing that work. The architect will also stake all tree locations.

At this point, we are completing plans for our first phase of construction that is scheduled to begin in September of this year. Part of the first phase includes a new retaining wall around the eighteenth green, new bunkers around the green and enlarging and resurfacing the teeing area of #18.

In general I feel very fortunate to be included in this project, not only because the course is getting the attention and work it had been needing so badly, but also because I have been allowed to play such an important role in this project. I feel fortunate that my club has had that foresight to plan for the future of Harbour Trees Golf Club.

I firmly believe that a competent architect and a Master Plan are the answers to a lot of questions.

Credit: The Indiana GCSA Newsletter, March 1987

GOLF CART PATH PLANNING

by Grant T. Spear

INTRODUCTION

Are golf cart paths really necessary on the average golf course? The use of golf carts and paths on courses is a highly debated issue among individuals within the golf industry. Most Southern and many Northern golf course superintendents believe path systems maximize golf cart revenue. Whether or not golf carts are good for the game, even wider use of carts is anticipated in the near future and planning should reflect this fact.

PERSONAL SAFETY OF GOLF CAR DRIVERS

From the initial planning stage, one must fully realize that responsibility for the safety of people and property exposed to the finished path is an inherent aspect of all design activities. The number of golf cart connected liability and damage suits has been rising. In some cases the golf course owner, the golf cart manufacturer, the cart dealer, the course's golf cart mechanic, the course architect, the paving contractor who installed the path and others are all named as defendants. Losses in such lawsuits can be well over a million dollars, so precautions must be taken in designing golf cart paths.

"The best way to deal with potential litigation is through the use of documentation, (which should be) sufficient to establish what the superintendent and staff have done or observed with regard to the course (Ochs 26)". Equipment maintenance records as well as periodic safety checks should be done on each individually numbered golf cart. A list should be made of exactly what is checked in each inspection.

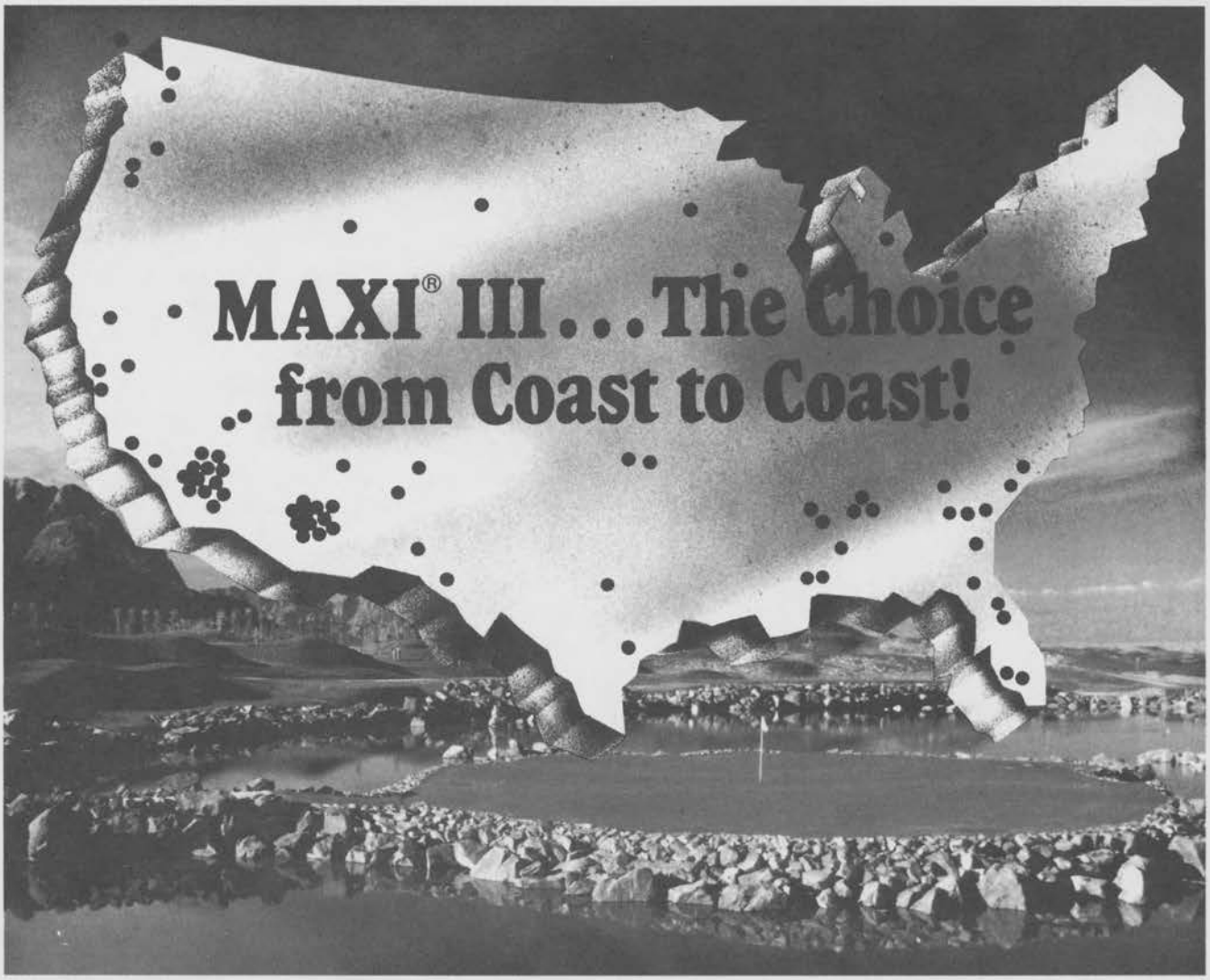
Other precautionary steps should include the following:

(1) Ask golf cart suppliers, before signing a contract, to have an engineer on their behalf inspect the course, slopes, bridges and paths for safety. Get a written affidavit stating that an engineer inspected conditions and certified that the equipment is capable of safely and routinely negotiating them, even with inexperienced drivers.

(2) Install all safety features recommended by the designer like curbs, speed bumps, traction grooves, warning signs, barriers, route indicators and anything else.

(3) Clearly post driving instructions on golf cars for new and inexperienced drivers. This should include a warning about drinking or using "judgement impairing" drugs while operating a cart.

(4) Rental slips should contain a liability disclaimer protecting the owner which was written by a lawyer.



Stadium Course, PGA West

Golf's Premier Irrigation Control System

Repeatedly the choice of the world's leading architects and superintendents, MAXI® III from Rain Bird is recognized as golf course irrigation's most exciting and versatile computerized control system.

Sophisticated. Reliable. Powerful. MAXI® III offers state-of-the-art irrigation technology. An IBM computer, too. Not to mention the ability to handle a wide range of important functions. Lighting—security—and a host of other necessary operations.

Legends in the making—the great golf courses of tomorrow are being built today. And MAXI® III is there!

Controllers. Rotors. 50 years of golf course irrigation experience.

Rain Bird — the choice from coast to coast

RAIN BIRD®

CENTURY RAIN AID

3400 Jefferson S.E., Grand Rapids, MI 49508 ..... **616-452-3373**
31691 Dequindre, Madison Hts., MI 48071 ..... **313-588-2992**
22159 Telegraph, Southfield, MI 48034..... **313-358-2994**

Michigan **TOLL FREE 800/544-9219**

(Continued from page 10)

These extra measures may be costly, time consuming, and bothersome, but they may be the difference between winning and losing a court case. Besides, the records may also save money in maintenance and repairs; personal computers are handy for such records.

RULES OF THUMB FOR GOLF CART PATHS

No standards of placement exist for golf cart paths. The extensiveness of paths on a golf course can vary from limited paths near tees and greens of certain holes to a system covering the entire course. The factors in deciding the extent include: (a) the course design relative to traffic intensity, (b) the intensity of play, (c) the funding available, and (d) the personal feelings of members toward golf cars.

WHEN TO INSTALL CART PATHS

Regardless of cultural practices on a course, scarred bare areas may result from intense traffic. Soil erosion is increased in such areas. Also, traffic tends to move around these bare spots enlarging the damage more and more.

The common solution is to install a path to confine the intense traffic and allow turf to grow back into the surrounding area. "Cart paths are the only realistic solution to bare, eroded areas (Beard 536)." Other specific reasons for installing paths include minimizing washout areas on hilly courses, increasing the safety of golf cart operation especially when the course is damp, reducing soil compaction in heavy traffic areas and directing traffic flow to minimize slow play problems.

GENERAL GUIDELINES

Paths should be as close to the tees as possible without completely destroying the aesthetics. Ideally, run the path parallel to the length and flow of the tee so golfers will spread possible wear all along the margins. Place the path close to where most people are expected to hit the ball in the fairway, yet reasonably out of play. Although close placement evokes the controversy about the balls hitting the path, if the paths are too far from the fairway, either use of them will slow play or nobody will use the paths. The superintendent and designer must decide on the placement on an individual basis for each hole. Also, one well placed path segment can often serve two holes in the case of parallel fairways.

A combined golf cart path and service road cuts the amount of paving and the overall cost. A double duty path obviously will be built of stronger materials and therefore could also provide random security and emergency help service to stranded or distressed golfers. It is generally wise to locate irrigation satellites near paths, to allow for emergency vehicles to easily penetrate the central core of the course and to design bridges, tunnels and crossings to accomodate light trucks.

MINIMIZING POOR AESTHETIC QUALITIES

Since golf cart paths generally disturb the landscape, conceal them as much as possible. The path can sometimes be used as an accent or can be given a more organic look if it is inconcealable. Harsh qualities can be masked with bunkers of comparable coloring, shrubs, ornamental grasses, flowing curves rather than straight lines and by the type and color of construction material chosen. Dark colored materials of a hue similiar to the surrounding turf are preferred with few exceptions. However, white limestone may blend well with sand bunkers.

FACTORS IN MAKING PATH DECISIONS

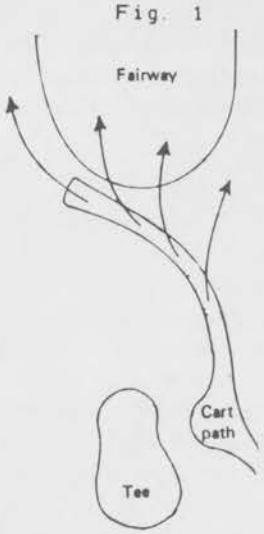
The practical demands of the course's soils, the climate and the amount of available construction funds must also be considered. If the goal is to at least meet the costs of the golf carts and paths with rentals, then the long term financial picture must be considered. A short rental season and/or the probability of low golf cart volume dictate the best type of path to install. A complete path network is probably not necessary.

DESIGN

Many people feel golf cart paths should be installed on new courses only after about six months to a year of play. This allows the superintendent to get a picture of the traffic patterns while taking safety and ease of play into account. Others think paths can be built with the new golf course. A major disadvantage of waiting to install a path is that golfers may have already developed habits of driving in the wrong areas which will be difficult to break. A third approach, used when funding is limited, is to draw up an entire path system for a course. As money becomes available, segments are contructed starting with the areas of severe wear to the areas showing the least wear.

Limited Paths. On well-drained golf courses limited paths can be installed only in trouble spots allowing cars to travel on the turf elsewhere. Paths from tees which end abruptly usually see heavy wear at the end. Solutions to this problem include having the path arc slightly at the end to spread out areas of wear, using a flared cart path terminus with portable barriers or combining to two (see Fig. 1).

Fig. 1



Measurements. Paths widths usually fall within a range of 6 to 10 feet with 8 feet being considered the norm. A reason for this norm is that asphalt-laying machines will work at 8 foot widths. Besides, carts stay on a path better as it widens and maintenance vehicles fit well, too.

PROBLEMS

Avoid sharp curves by banking and/or widening the curves. Steep slopes near water or drop-offs which paths traverse should have guard rails, walls or curbs. Excessively steep uphill slopes and downhill inclines which cause excess cart speed are best avoided. Surface contours are recommened to allow surface water to freely flow over or off the cart path. A center 3 to 4 percent higher than edges is suggested for flat terrain. In hilly terrain sloping to one side works well (Beard 538).

CHOOSING CONSTRUCTION MATERIALS

The types of path construction can be as simple as dumped and graded gravel to concrete of sidewalk standards. The considerations in selection of materials follow: (a) wear tolerance, (b) cost, (c) effects on play, (d) aesthestics, (e) long-term maintenance, (f) availability, and (g) course topography.

COSTS OF CONSTRUCTION

The cost of materials parallels the sophistication of them starting around 50 cents per square foot of rolled gravel to $2 per square foot for top-of-the-line concrete (Hurdzman 14).

Construction costs should be weighed against longevity of the path, since response to internal soil drainage and climate is the most important cost determining factor. Paths rarely have a chance to wear out before weather-specifically wet or freezing weather-ruins them.

The freezing and heaving, thawing and settling of the path's surface or base is primarily responsible for the destruction of any paved surface. Combating these forces in the construction of the path or pavement will increase cost but add to the path's life. The best solution realistically available is to reduce soil water content as much as possible and produce a pavement resistant to settling and heaving.

SURFACE MATERIALS

Cheapest Paths. Spreading stone, gravel, wood chips or other loose organic materials on the ground and compacting it is the least expensive alternative for a path surface. Lower budget courses which start with a gravel surface may, once it has settled and stabilized, wish to use it as a subbase for asphalt or concrete at some future date. Of course, this settling decreases the longevity of gravel as a surface, too.

Organic materials work well on level areas where erosion is not a problem. An advantage besides low costs is that it usually absorbs the impact of stray balls; hence organic materials are often used on paths in areas which often come into play. An obvious disadvantage is that reapplication is periodically needed to replace losses from erosion, weathering and decomposing else they will too rapidly soften and degrade. Another potential disadvantage to organic products is that availability problems may drive up the cost.

Improved Weathering Resistance. A further improvement can be made by installing an engineering fabric between the surface material and the soil. This cloth provides dimensional stability so the path materials cannot be pushed down and provides some underdrainage, as well.

(Continued on Page 14)

(Continued from Page 13)

Additional costs of such materials is about 20 cents per square foot, but it may triple or quadruple a path's life. However, these engineering fabrics may have environmental limits since some will become brittle and break in extremely cold environments.

Without these improvements these cheaper paths are short lived compared to paved surfaces. They may last anywhere from a few days, in extremely wet conditions, to about a year prior to maintenance.

Hard, Long-Lasting Surfaces. Pavements better resist environmental and traffic wear. Although the initial investment is higher, they are more maintenance free.

A simple form of paving, known to some as 'chip and seal'', is made by preparing a smooth base, applying a thin layer (about 2 inches) of gravel chips, covering it with tar and rolling. Repeating this process to a 4 inch depth reportedly works well for light vehicles. An underbase of gravel (4 inches), engineering cloth, or both will extend the life of this paving by reducing soil water effects.

Chip and seal costs about 75 cents per square foot. This low-maintenance, lower costing pavement has a textured look and will last nearly as long as blacktop (Hurdzan 16).

Blended asphalt, or blacktop, is a commonly used surface (see Table 1) and costs as little as $1 per square foot to $2 per square foot using a gravel base and engineering clothlayers to reduce weathering (Hurdzan 16). All blacktopped surfaces are very low maintenance, long lasting and smooth riding.

TABLE 1

Cart path construction materials by percent use.

Asphalt	65	Gravel	45
Other:	17	Don't have cart paths	12

9 mentions: Cement/concrete
3 mentions: Dirt
1 mention each: Limestone-Shells-Lava rock-Sand-Woodchips.

Many superintendents have found that gravel subbase for blacktop negatively influences drainage unless tile drainage is added. Hence, most pavers recommend direct placement of blacktop layers over the soil over engineering cloth. Usually at least two inches of course ashpalt is used for the bottom layer, followed by another 1 to 2 inches of coarse asphalt or fine asphalt which feels better under spiked golf shoes. Finally, cement, which has high rigidity, nearly no maintenance requirements, practically endless life and the best ride, is the most expensive paving surface. Water and acid-forming and acid-based chemicals are hard on cement. Reinforcing rods can be added to cement for increased strength much like the addition of engineering cloth to asphalt.

For higher traffic roads carrying heavy equipment, at times, cement is the paving of choice. Good underdraingage is still necessary even though resistance to weather is better than other materials. Aa gravel subbase (4 inches thick) and tile is usually used. Pavers recommend a 4 inch thickness concrete with expansion joints in Northern climates. A rough texture surface is preferred in areas of foot traffic since golf spikes don't mix with smooth cement.

Alternatives. Recent innovations not yet fully tested under golf course conditions are honeycomb or matrix structures. Composed of wear-resistant materials ranging from concrete to plastic. These structures are designed to carry the weight of repeated golf cart, vehicle and foot traffic. Such a material with regularly spaced openings or cells in various geometric configurations, if properly installed over a well drained subbase with a coarse textured root zone, allows adequate water infiltration for turf to grow in the spaces (Beard 539). Interspaced vegetation provides cooling of the surface and it blends into the adjacent turfed landscape. The full potential of such a material is yet to be determined.

ENCOURAGING PATH USE

The main way to get golfers to use any golf cart path is to have the proper placement as was stated earlier. Most golf courses have to route their paths in a few areas in patterns that are less convenient or different from previous traffic patterns. The addition of traffic aids to encourage use, such as signs, chains, ropes, lines, landscape plantings or movable barriers, are positioned to direct traffic to the path. Golfers will hopefully adopt the new patterns and allow the eventual removal of the aids.

More drastic measures like new bunkers, trees, grassy mounds or shrub plantings may be necessary in extreme cases. On golf courses with complete path systems, carts are sometimes restricted to the paths. Even with incomplete paths, courses sometimes restrict cart traffic to the paths on the holes which have them. These regulations are best enforced by meetings with the club membership.

There are obviously no absolute guidelines for golf cart use on a cart path system. All decisions should be made on the basis of the course's topography, the extent of the cart path network, the physical soil conditions, and perhaps most importantly, the opinion of the course's clientele.

Credit: Iowa GCSA

IDENTIFY AND CONTROL POISON IVY

Poison ivy has been particularly vigorous and widespread this season; it is well-adapted to many locations. Each poison ivy leaf is composed of three richly green, glossy leaflets. The tips of the leaflets are usually pointed, and their margins are often coarsley toothed.

Where poison ivy can climb trees, fence posts or other structures it becomes a vigourus vine. Where there is no support, it sprawls to become a ground cover; in some conditions, it becomes woody and shrubby. In this form it is sometimes called poison oak, although poison oak is a different, but closely related plant. Poison ivy usually has smooth white berries; poison oak has slightly hairy white berries with small, warty projections on them.

Poison ivy and poison oak are sometimes confused with a shrubby trifoliate wild plant known as fragrant sumac. One of the easiest ways to tell poison ivy and fragrant sumac apart is to crush a leaf; fragrant sumac is quite aromatic and poison ivy has no distinctive odor. Be sure to wear gloves when performing this test.

Poison ivy plants are difficult to kill. Cutting off existing plants will not provide control because poison ivy develops extensive underground runners. For this reason, digging will not work. Herbicides, such as amitrole and 2,4-D are the best solution, but ones designed to kill poison ivy will also kill the plants that poison ivy grows around and through. As the vines grow through hedges or shrubs, use long-handled pruning shears to cut the plants off at ground level. When new growth appears beneath the desirable plants, it can be treated without harming other foliage. Herbicides kill poison ivy best when applied to leaves that have just reached full size. Old, well-established poison ivy may require repeated treatment.

Credit: University of Missouri Cooperative Extension Service

FUSARIUM NIVALE, SCLEROTIUM ROLFSII, BASIL CELL CARCINOMA. . .

by Robert Breen Sr.
Arrowhead Golf Club

Fusarium Nivale, Sclerotium Rolfsii, Basil Cell Carcinoma, Rhizocolonia-Salani, Melanoma, Melmitha Sporium Vagans, Squamous Cell Carcinoma are but a few of the diseases that, unless specific precautions are invoked, a Chicago area superintendent may encounter in his career.

If some of the above do not sound too familiar, it is because they are not turf diseases, but types of skin cancer that has afflicted several superintendents as a result of overexposure to the sun's ultraviolet rays.

In the past, much of the sun's ultraviolet rays were prevented from reaching the earth's atmosphere by a stratospheric ozone screen; however, this protective screen is being depleted by the misuse of chlorofluorocarbons in industry. The House Energy and Commerce Health and Environment Subcommittee has stated that skin cancer has reached epidemic proportions as a result of this abuse and is asking the present administration to initiate diplomatic negotiations to persuade the industrial world to make deep cutbacks in the production and use of chlorofluorocarbons.

Lawrence L. Johnson, M.D., a dermatologist who practices in St. Charles, describes the three most common types as follows:

The most common type of skin cancer is called a **basal cell carcinoma.** This cancer comes from a layer near the surface of the skin called the basal layer. These cancers are the most common type of cancer in the United States. They are usually slow growing and not too aggressive. They rarely go inside the body and hurt people. However, if not taken care of, they can be quite destructive to the skin and to the tissues just under the skin. Most basal cell carcinomas if caught early enough can be easily removed and cured in one treatment.

The second most common type of skin cancer is called a **squamous cell carcinoma.** This cancer comes from the layer of skin called the squamous layer. These are not nearly as common as basal cell carcinomas, but they are considered more dangerous. Although they usually do not go inside the body, they do have the potential. Squamous cell carcinomas are most common on the lip and in the oral cavity where they can go inside the body very quickly.

The only cancer of the skin that is truly dangerous is the **melanoma.** This tumor arises from pigment cells, not skin cells. Melanomas can also be found in the eye or the central nervous system or in another area where pigment cells exist. The melanoma can occur on any area of the body. In contrast, basal cells and squamous cells occur

(Continued on Page 20)

NEW! RINGER™

TURF RESTORE™

Restore the biological balance!

- **Specially formulated for golf course and commercial use**
- **Prevents and controls conditions that cause necrotic ring spot, summer patch, brown patch and other patch diseases**
- **Reduces expensive fungicide requirements**
- **Proven to reduce thatch build-up**
- **Slow-release, organic nitrogen (No urea)**
- **All natural, non-toxic**

10-3-4
Net Weight 50 Lbs.

GIVE THIS AD TO YOUR SALESPERSON AND RECEIVE $1.00 DISCOUNT PER BAG.

BENHAM CHEMICALS

West Michigan Sales Rep: JERRY MAKAREWICZ

G.R. Wrhse: (616) 698-1836 Residence: (616) 454-3976

MI TOLL FREE: 1-800-482-6520

24800 N. Industrial Drive, Farmington Hills, MI 48018

HOW WELL DOES THE AMERICAN GOLFER PLAY?

National Survey Reveals Answer For The First Time

The typical American golfer reports that he plays an 18-hole round of golf in 25 strokes over par, or an average score of 97. This, and other information has been provided for the first time by a survey of American golfers conducted by the National Golf Foundation. The survey, titled the Golf Consumer Profile, was recently published by the NGF and contains never before available information on how golfers view themselves as players, consumers, media observers, and much more.

Two-thirds of all golfers, according to the Golf Consumer Profile, report they normally break 100 on a regulation 18-hole golf course. Only one-third regularly complete play in under 90 strokes, and the elite group that posts scores in the 70s accounts for only eight percent of all golfers.

Men do a little better than the scoring norm, averaging 23 strokes over par per round. Women average 35 strokes over par on average.

Senior golfers who are a little short off the tee should take heart in their accuracy, for the statistics show seniors over 60 checking in with average scores 24 strokes over par, one better than the national average for all golfers.

How far do golfers claim to hit the ball? The average male golfer says he realizes about 199 yards off the tee, while the average female's tee shot is approximately 131 yards. Only about 17 percent of males and 2 percent of females boast tee shots of 250 yards or more. When the men and ladies select five irons for approach shots, the men average 137 yards with that club, the ladies average 91 yards.

Where does the ball go once it's hit? Almost 50 percent of all golfers admit the fade or slice most accurately describes their general ball flight pattern. However, as a golfer's skill increases, he or she is more likely to claim a straight ball or a desired draw, according to the survey.

The Golf Consumer Profile survey was conducted by mail using the Golf Consumer Mail Panel maintained by the NGF and Market Facts, Inc. An eight-page questionnaire was sent to a nationally representative sample of 1,973 golfers in the summer of 1986. 1,212 usable questionnaires were returned. The return sample was weighted to match U.S. Census statistics on key demographic variables.

The National Golf Foundation, created in 1936, is golf's research and promotional organization. A nonprofit organization, the NGF includes in its membership more than 500 golf product companies, national, state and local associations; golf course architects and builders; golf publications; and more than 3,000 golf courses across the United States.

usually in sun exposed areas of skin. The incidence of melanoma cancers is increasing at an alarming rate. Deaths have even been recorded in teenagers from melanomas. Melanomas can arise spontaneously or from an irritated mole. Usually melanomas are black or dark brown, but they can be almost skin colored. It is imperative that melanomas be caught early because surgical excision is the only good treatment.

The person most vulnerable to skin cancer is an individual with blue eyes and fair complexion. This does not rule out others who spend much of their life outdoors.

Dr. Johnson suggests a suncreen for all Caucasians who are exposed for long periods to the sun's ultraviolet rays. A sunscreen is a lotion designed to give protection in varying degrees. A sunscreen with a SPF of 10 offers ten times as much protection compared to no protection. The ultimate in protection is attained with a sunscreen offering a SPF of 15. Baby Oil, mineral oil or cocoa butter do not contain any protective ingredients and should be avoided. Dr. Johnson also suggests a Sam Snead type hat as being preferable to a cap.

If you are at all in doubt whether or not you have skin cancer, I would suggest you see a dermatologist, as in most cases the treatment is painless, consisting of freezing the affected area with liquid nitrogen. The dermatologist will also have a better opportunity for early detection of melanoma, which has increased 85% over the past years and can prove to be life threatening.

Credit: Bullsheet

NEW

KUBOTA

OF
GRAND RAPIDS (364-7031)

4WD FRONT MOWER
F2000

Efficient Grass-Cutting Performance from an Economical, Diesel-Powered Front Mower Tractor.

APPLICATION FOR MEMBERSHIP

WESTERN MICHIGAN GOLF COURSE SUPERINTENDENTS ASSOCIATION

(A NON-PROFIT MICHIGAN CORPORATION)

Date _____, 19_____

☐ Class A - $30.00 ☐ Class B - $20.00 ☐ Class D - $35.00 ☐ Honorary

Name _____

(First Name) Middle (Wife) (Last)

_____

(R.F.D. or street and number) (Residence Phone No.)

RESIDENCE

_____

(City or Post Office) (State) (Zip)

Name of club or employer

Address _____

Business Phone No.:_____ Residence Phone No.:_____

Exact title of your present position

EXAMPLES: (Sup't. of Grounds)(Sup't.-Manager)(Sup't.-Pro)(Ass't. Sup't.)(Other)

I have been employed at my present position for _____years. Prior to this I had been employed as follows: (Please state type of work engaged in)

_____

_____

_____

Send my mail to: ☐_____ ☐_____

Home address Business address

Each application MUST be signed by two Class A members of the Association who will certify as to reliability of the Applicant.

Attested_____ Address_____

Attested_____ Address_____

Applicant's Signature_____

PLEASE RETURN COMPLETED FORM TO THIS ADDRESS

Chris Fochtman
7632 Alpine Ave., N.W.
Sparta, MI 49345

Nothing cuts like the Ransomes 5 gang reel team

RANSOMES
BOB-CAT

Fast-cutting, diesel-powered, all-hydraulic systems save time and money.

Motor 350D
- Kubota 38 HP Diesel
- All hydraulic driven reels and lifts
- 24" turning radius and uncut circle "0"
- 11' 6" width cuts 8 acres per hour

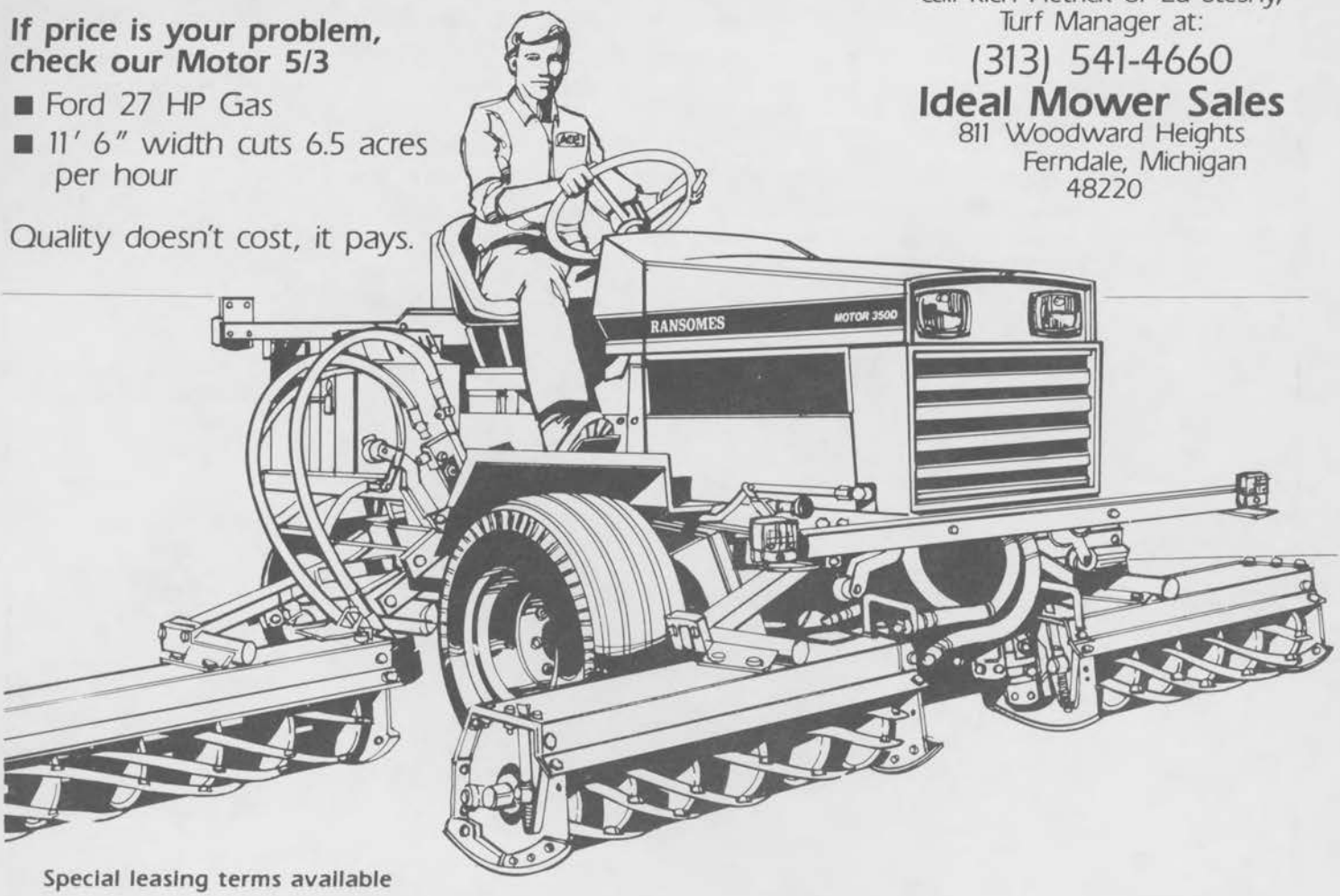
If price is your problem, check our Motor 5/3
- Ford 27 HP Gas
- 11' 6" width cuts 6.5 acres per hour

Quality doesn't cost, it pays.

For information or demonstration, call Rich Hetrick or Ed Stesny, Turf Manager at:

(313) 541-4660

Ideal Mower Sales
811 Woodward Heights
Ferndale, Michigan
48220



Special leasing terms available

WESTERN MICHIGAN GOLF COURSE SUPERINTENDENTS ASSOCIATION'S

GOLF DAY

★ Monday, August 31st, 1987 ★

COUNTRY CLUB OF JACKSON

Proceeds go to Michigan Turfgrass Foundation Research Fund.

4 Man Best Ball
— Best two of four full handicap —

● ENTRY FEE: $75.00 per player ($300.00 per team) ●

INCLUDES:

- **GOLF (8;00 A.M. Shotgun / 1:00 P.M. Shotgun)**
- **GOLF CART @ Country Club of Jackson**
- **LUNCH / REFRESHMENTS On Course**
- **DINNER @ 7:00 P.M. (Sharp)**
- **PRIZES**

*** Players In A.M. Shotgun May Play Arbor Hills Country Club In P.M. (Cart Is extra)**

_____ 8:00 A.M. Shotgun _____ Arbor Hills Country Club

_____ 1:00 P.M. Shotgun

_____
Name Handicap

_____

_____ _____

_____

Entries Must be Received by Aug. 21st, 1987

Make Check Payable To: W.M.G.S.A.

Mail To: Jeff Gorney
2715 Leonard N.W.
Grand Rapids, MI 49504

The proof is in the putting.

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.

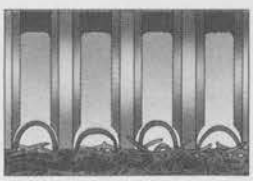
This unique, patented greens care system, a Jacobsen exclusive, concentrates on troublesome thatch and horizontal runners that can slow down putting, or even throw off putting accuracy.

The front roller "puckers up" horizontal runners and plant leaves, readying them for clipping.

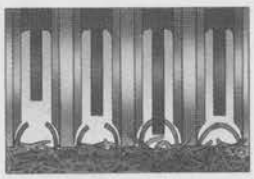
Then, the powered knife blades rotate *through* the slots in the front roller, cutting horizontal runners and removing thatch that can choke a green to death.

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

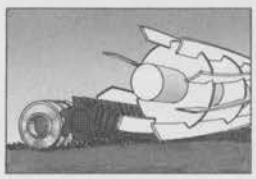
The result: Faster, truer putting and healthier, hardier greens, ready for play. And, you get all this without reducing the height of cut.



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.

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.

Finance plans available. Jacobsen Division of Textron Inc., Racine, WI 53403. Telex: 264428.

Greens King and Turf Groomer are trademarks of Jacobsen Division of Textron.

JACOBSEN
TEXTRON

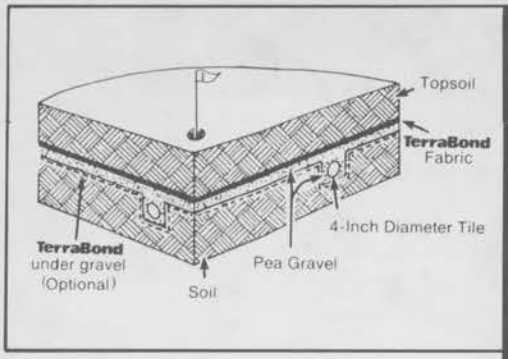
Jacobsen Division of Textron Inc.

MILLER WEST, INC.
274 Mart Street S.W.
Grand Rapids, MI 49508
(616)241-4481

SPECIFY THE BEST FOR YOUR GOLF COURSE

Warren's® TerraBond™

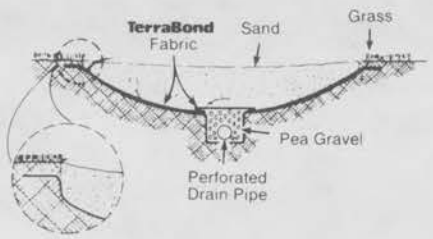
PUTTING GREEN CONSTRUCTION



Use TerraBond as a replacement for the usual 2″ coarse sand layer between the greens mix and the gravel drainfield. The fabric will eliminate downward migration of the mix into the gravel and the subsequent reduction of water flow from the green.

TerraBond's high water permeability and highly engineered uniform density and EOS (AOS) make it an ideal fabric for this use. It will not rot in the soil-water environment. Its horizontal (planar) flow characteristic moves excess water horizontally out to the sides.

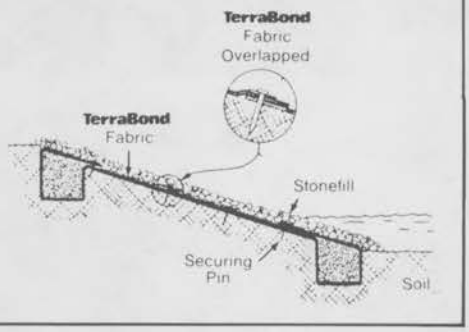
SANDTRAP LINING



Line the entire golf sand trap with TerraBond, including 6″ under the surrounding sod. The sod's roots will knit the fabric to the soil beneath. Clay and rocks will be totally restricted from moving up into the sand.

Sand wash-down in rainstorms will be dramatically reduced, because TerraBond interrupts the interface of sand/soil. Rakeup will be greatly reduced. Time will be saved. Also, ''wrap the gravel'' in the trap drain to keep it flowing indefinitely. TerraBond's polyester will resist chemical and ultraviolet degradation.

SLOPE EROSION CONTROL



TerraBond is utilized beneath cut slope stone protection (rip-rap) as shown above. The fabric provides long-term confinement of cut slope or fill material.

Being constructed of soft and pliable needle-punched polyester, TerraBond will remain stable and functional for many years, in spite of potential exposure to the sun's ultraviolet rays and/or concentrated hydrocarbons such as gasoline, diesel fuel, oil or hydraulic fluid.

TerraBond also can be used in weed control, gravel path construction, retaining wall filtration, subsurface drainage, patio construction and planter filtration/separation.

Warren's® TerraShield™

Polyester † Geotextile Ground Covering

. . . the best greens BLANKET in the business.

THE EXPERTS AGREE

Winter 1984-1985 Wind Desiccation Damage Test on bentgrass greens
(Univ. of Nebraska-Test compared the protection of TerraShield cover with clear plastic cover and uncovered control area.)

- Desiccation injury around test site was severe. Uncovered control area had 60% damage. TerraShield covered area had no injuries. Control area produced only 36% of the green cover obtained under TerraShield blanket.
- Green-up occurred 24 days earlier with TerraShield . . . and remained significantly greener than the uncovered control area for 21 days after cover was removed.
- TerraShield produced 3 times the recuperative potential of the control area . . . and twice that of clear plastic covered area.
- TerraShield enhanced soil temperature compared to uncovered control area.
- TerraShield remained in place all winter with no ripping or tearing despite heavy winds.

CALL FOR MORE INFORMATION, SAMPLES, AND WHOLESALE PRICING.

CENTURY RAIN AID

3400 Jefferson, S.E.
Grand Rapids, MI 49508
313-452-3373

31691 Dequindre
Madison Heights, MI 48071
313-588-2992

22159 Telegraph
Southfield, MI 48034
313-358-2994

CALL TOLL FREE number MICHIGAN 1-800-544-9219

'WESTERN VIEWS'
6442 E. Encantado Ct., N.E.
Rockford, MI 49341

Bulk Rate
U.S. Postage
PAID
Permit #6
Rockford, MI