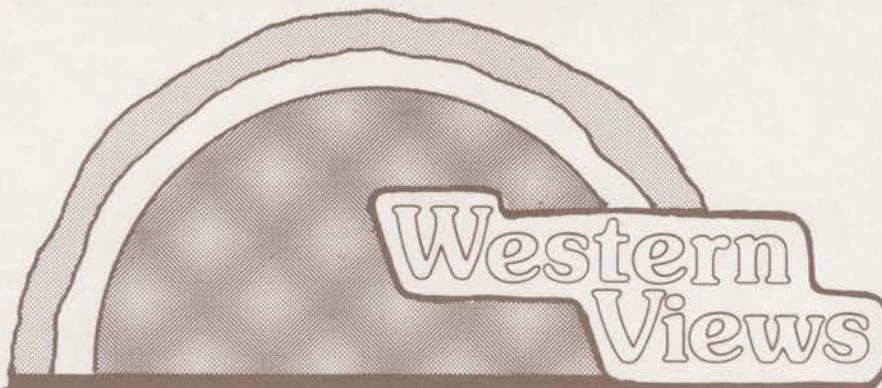




Official Publication of the
W.M.G.C.S.A.



July/August 1983

President's Message by Mark Magee

Michigan's unpredictable weather has produced another tough summer for the golf course superintendent to maintain turf. Record temperatures and humidity are the climatic conditions with which we dealt this year. These conditions in Western Michigan in addition to the varying amounts of rain fall produced a very tough growing season. Turf problems ranged from extreme wilt conditions to conditions which produced pythium blight.

The summer of 1983 has been a classic year leaving the golf course superintendent with new unsolved problems. We are fortunate to have Michigan State University and the Michigan Turf Foundation ready and willing to help us with our turf problems. The Hotline 517-355-5221 has been very successful. A recording informs the caller of possible turf problems that can occur on a weekly basis as well as allowing the caller to present questions.

The M.S.U. Field Day in September also presents the golf course superintendent with an opportunity to find answers to turf problems experienced this year. It would behoove all of us to take advantage of this opportunity. See you in September.

Coming Events

Field Day — September 1, 1983
Hancock Field Lab, M.S.U.

Golf Day — September 12, 1983
Greenridge Country Club

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MEETING DATES

September 12 Green Ridge CC
Golf Day

October 4 Thornapple Creek GC

November 4 Walnut Hills CC
Fall Party

MANAGERS—SUPERINTENDENT MEETING

The first annual Golf Course Superintendent and Club Manager's meeting was held July 18th at Blythefield Country Club. The meeting was well attended and well received by both associations. Roger Barton was the host superintendent, and Bill Brown the host manager. Everyone enjoyed a delightful afternoon of golf followed by an exquisite meal.

Dr. Lou Bellinger of Davenport College spoke on "Participative management." Dr. Bellinger stressed the importance of delegation of responsibility as a significant aspect of proper management. "Surround yourself with capable people and let them work to their capabilities."

Communications between departments is extremely critical. Hopefully, this meeting has helped to open new avenues of communication between managers and superintendents. A joint meeting should become bigger and better each year.

WHAT A YEAR by Keith Paterson, CGCS

Well, it's almost over!! One of the most incredible summers I have experienced in my short career as a superintendent. Abnormal hot spells, extended periods of dryness, unusual disease problems, are but a few of the challenges that faced us in 1983. It seems that every August I say to myself, "If I can live thru a summer like this past summer, next year shouldn't be bad at all." I hope this is particularly true this time. Half way thru July, I had to adjust my goals from that of, "Trying not to lose any grass" to "trying to minimize my losses."

The next two articles are just a reminder that we are all in the same boat facing similiar problems. The first article is a letter by Marty Miller, superintendent at Knowlwood Country Club in Detroit.

I hope this article by Louis Miller from Kentucky raises some important issues in your mind as it did in mine. I'm sure most of us feel the same about our job and profession, but do we accept all the negatives about our profession? Should we seek to change some of the aspects of our work which infr-

inge on our personal lives, especially on our relationships to those most dear to us, our wives and kids? Do we put pressure on ourselves and put in extra hours trying to meet every whim of our golfers, owners or board members, or is it our employers who make these demands? I know my job has been difficult for my family to adjust to and I'm not sure they ever will, but maybe I should be making some changes in how I do my work.

These questions and many more have been on my heart and mind for a few years, and I'm certain all of us as superintendents have struggled with this issue before. It's for this reason that this topic is on the educational program this year. In seeking to promote a professional image, which is one of our objectives, we can't lose sight of the fact that our families are an important part of that. Without peace and tranquility at home, it's tough to do our jobs and do them well.

This second article is the article by Lou Miller, that Marty mentioned in his letter!

AS I SEE IT by Louis E. Miller

Let's take a serious end of the season look at this profession that so proudly goes by the title of Golf Course Superintendent. When expounding on the various facets of our professionalism we almost always end up by telling whomever will listen that we are now Golf Course Superintendents and that we as an organization dropped that title "Greenkeeper" many years ago because our responsibilities now included much more than keeping the green. So, the GCSAA was formed and even just a few years ago the idea was being toyed with once again to change our name, as a profession.

Things have changed even more over the years, and now instead of just being golf course superintendents, we maintain tennis courts, swimming pools, skeet ranges, skating rinks, riding stables, polo fields, club house grounds, greenhouses, nursery's, both sod and tree, parking lots and in some cases miles of roads, not to mention cartpath's and fleets of golfcarts. We now hear of budgets in excess of one and a quarter million dollars for eighteen holes. Our responsibilities have far exceeded our title. Instead of being a golf course superintendent, a polo field superintendent, etc.,etc., then I propose that we change our name.

I don't feel that we should change our name to anything so grandiose as Superintendent of Grounds, which would be far too logical, but not too poetic in its description, but something that is

far more down to earth. Whenever anybody asks me what I do for a living, I simply tell them that my title is "Odd Job." It has a nice ring to it and sort of covers everything in one short definition. Upon reading this one might get the idea that the title is a little unusual, and I would be the first to agree. However, let's face it, it covers the whole gambit of our profession in one full swoop. We, as an organization could change our name to the "Odd Job Associates of America," or better lettered as the OJAA.



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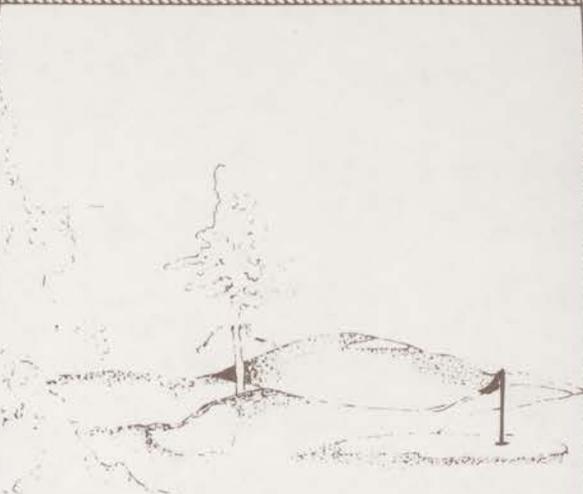
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Some of you might not think that I'm too serious about this. Well, that is true, partially, but then I've never been too serious about anything. Maybe that is what we need, a lighter look at our profession. I think maybe that we sometimes get so caught up with our professional status, or rather what we think our status should be that we lose sight of what we really do for a living. Don't get me wrong, I really like what I do for a living and enjoy it, most of the time. I think that over the years we have all been exposed to the wonderful charms that our respective profession has. We all know of the beauty and the cruelty of nature, and what it means to win the battle, even if it is just for a little while. We experience the feeling of accomplishment of seeing a green built from an area that was once a piece of landscape. The beauty of the flowers in spring, the leaves changing color in fall and the many fragrances of nature. The thrill of working outside in the fresh morning air, and beauty of the dew on the grass. The presence of the small animals and the sound of crickets and frogs at night. The birds in the early morning and the sight of a newly cut green. All of these things I like and a whole lot more. There are however a whole lot of things that I don't like about this profession and I think that it is time someone spoke out about the many facets that are really bad.

I don't like the endless long hours in the summertime, I don't like working seven days a week, week after week. I don't like getting up at five o'clock in the

weekends and coming to work. I don't like working on holidays such as Memorial Day, the Fourth of July and Labor Day. I don't like it when everybody also gets a three day weekend and I don't. I don't like it when I promise my kids I'll take them swimming and I run two hours late, because some greens had to be sprayed on a weekend. I don't like it when equipment breaks down on a weekend. I don't like it when it rains on Fridays. I don't like getting my hands burned on a hot muffler when trying to adjust the carburetor on a rotary mower. I don't like getting the top of my knuckles cut off when a wrench slips while trying to tighten a bolt on a mower frame. I don't like getting the grease and grit on my hands while trying to put a chain back on a sprocket. I don't



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like getting grease or oil on a brand new thirty-dollar golf shirt. I don't like breathing the dust from wettable powder chemicals and what it does to my lungs, nose, eyes and mouth. I don't like working around the chemicals for periods of time that I smell like I took a ride in the back of a garbage truck and my kids ask, 'Daddy what is that smell?' I don't like rushing construction projects and coming home day after day absolutely exhausted. I get tired of being tired. I absolutely hate people who drive jeeps and motorcycles on my fairways and greens and needlessly destroy what I have worked so long and hard to keep. I hate people who take flag poles and trap rakes and destroy the putting surfaces that just a few hours before were magnificent. I hate to see grass or anything die for that matter when I've tried so hard to keep it alive. I hate the constant smell of smoke and exhaust in my nose and lungs. I hate golf spikes that come off shoes on the green, and get caught in the mower. I hate crabgrass and unrepaired ball marks. I hate trying to do a job with junky equipment that has been used three times longer than it was designed for.

I don't like surprise golf tournaments that were not on the schedule. I don't like getting my knees cut while kneeling on the asphalt or concrete and trying to adjust a mower. I don't like coming in on weekend evenings while a crew mows fairways. I don't like people who think that they only place to have a beer party is on one on my putting greens. I don't like peo-

ple who think that there are only two ways to run a golf cart, start fast and stop fast.

I guess that in reality that for every one bad thing that a person could think of about our profession, they could think of at least three good things. There is however something that is very wrong about the social and psychological ramifications that are entailed in this business of managing country club and recreational complexes. (It has long since outgrown just the management of turf and golf courses). Louisville is not a large metro area, and with nine private golf courses in the immediate vicinity I did a little study. There are nine Superintendents on the respective courses. Their marital status is as follows. One has never been married, one is a widow, two are married and five have been divorced.

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A team of four tours the course and rates each hole on a scale of 0 to 10 on each of the factors. Zero means the absence of a factor and a rating of four is considered average.

The holes are scored according to degree of difficulty for both the expert and bogey player. The rating team does not play the course while rating it. That's so their judgements are not influenced by the way they are playing.

"It's an attempt to gain uniformity," said Knuth. "If obstacles are not considered in a course's rating, it brings in a lot of error. In the next two years, we'd (USGA) like to have all the 12,000 golf courses in this country rerated under the new system."

The team does not set the rating. Their rating is reviewed by a committee before being accepted or rejected. A course's final rating is then determined by mathematical formula that combines the obstacle rating and distance.

The new rating formula will allow for a slope handicap. The USGA has put courses into three categories - Panther Mountain (very tough), Perfect Valley (average) and Open Flats (wide open).

An average course rating, according to Knuth, is 69.0 with the average slope being 113. Under the new system, a player's handicap will have portability when he or she plays different courses.

"Using a rating system for bogey players allows for comparison between expert and other golfers," Knuth said.

The slope goes up or down, depending on the course played, and there will be more fluctuation in strokes for the high handicap player than there is for the low handicapper.

"The average player plays a course differently than does the expert," says Knuth. "Average players don't hit the ball as far, are bothered more by some hazards, while others don't affect them as much because of the distance differential."

As a result, a player with a 20 handicap from a "Pleasant Valley" type course, might only be a 17 if he plays at an "Open Flats" layout, but could be a 30 at an extremely tough "Panther Mountain" course.

Everyone who has played golf is aware of the inequities of the present handicap system. "Sandbagging" accusations are heard all season, but Knuth says "sandbagging" is often built into the system.

With this new method, the USGA is hoping to bring more equality and uniformity to the game. It won't, however, work unless the system becomes universally accepted.



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THE DUSTINS OF WESTERN MICHIGAN

by Jim Bogart

In their recent book, "The Golf Course," Geoffrey Cornish and Ronald Whitten discussed many of the historic golf families of the world. Among the families listed are the Morris' and Dunns' of Scottish golfing fame. One truly American golfing family discussed is the Maples family of North Carolina. Their family tree includes former GCSAA education director Palmer Maples, Jr. and 12 other family members who have been associated with the game of golf.

Here in Western Michigan, golf nurtured an even larger family. In fact, it is probably more accurate to say that the Dustin family nurtured golf in Western Michigan. Among the accomplishments of this family are the construction and/or operation of 28 golf courses. All but six of these are located in our area.

The golf heritage of the Dustins began in the early 1900's when Vet Dustin was hired as greenskeeper for the newly formed Kalamazoo Country Club. From this one man, the family can now claim a total of 27 brothers, sisters, sons, daughters, nieces, nephews, and in-laws who have made their living on golf courses. The family remains active with current WMGCSA member Bruce Dustin and his family operating the Pipestone Creek Golf Course in Eau Claire. Additionally, Bruce serves as superintendent for Wyndwicke Country Club in St. Joseph; the site of our August meeting. Two other Dustins; Stuart and Ira; also continue the family tradition as members of the grounds crew at Forest Hills Golf Club in Grand Rapids.

In the years between Vet and Bruce's family, Dustins have served as golf course greenskeepers, pros, managers, consultants, and builders. In fact, one family member has theorized that the WMGCSA may have been an out-growth of earlier family get togethers. Mrs. Doris Dustin Axtell remembers accompanying her father, Vet, on monthly visits to family members' courses. These visits included golf, followed by dinner and discussions of current conditions.

After taking the job at Kalamazoo Country Club, Vet soon enticed his brother Del and nephew John to join him. From these three, the golf bug quickly spread through the Dustin family as two other brothers, a brother-in-law, and numerous offspring joined the golf profession. Many of the early family members centered around the Kalamazoo area building courses such as Arcadia Brook and Gateway among others.

As the popularity of golf grew, the family moved out from their starting point at Kalamazoo Country Club. Vet was probably the first to move as he became greenskeeper for the new Cascade Hills Country Club in Grand Rapids. Other family members followed suit seeking new opportunities and soon Dustins were connected with golf courses stretching from Hastings to Niles and from Grand

Rapids to Vicksburg. One nephew, Bob, began his career in the South Bend, Indiana area consulting to the South Bend Country Club and Morris Park Country Club. In later years, Bob Dustin worked with WMGCSA member Rolfe Wells on the construction of Hampshire Country Club.

With mobility becoming a way of life, the Dustin family became even more wide spread. Stuart Dustin; who had succeeded his father, Vet, as greens superintendent at Cascade Hills country Club; carried the family name to Eastern Michigan. Moving to Pontiac, Stuart oversaw the construction of Shenandoah Hills Country Club which he continued to serve as superintendent for its first few years.

Donald Dustin also helped spread the family's name. He was summoned to the Warsaw, Indiana area where he completed construction of the Rozella Ford Golf Course. Donald also remained on this course for a few years serving as greens superintendent.

The most far flung of the Dustin influence was Frank Goodwin. Frank was one of two sons of Jenny Dustin Goodwin who started their golf course careers at Berrien Hills Country Club in Benton Harbor. While his brother, Lawrence, only worked at Berrien Hills, Frank made a move to the East Coast of Florida. It was there that he built and maintained a course near Cape Canaveral.

It becomes readily apparent that the Dustin name has long been connected with golf; not only here in Western Michigan but in other parts of the country as well. To truly appreciate the influence of this family, one must look at the family tree; or shall we say grass plant. Many blades have sprouted since Vet was hired at Kalamazoo Country Club. For those of us in Western Michigan today, we can be thankful that those blades produced numerous golf courses for our enjoyment and employment.

THE DUSTIN FAMILY TREE

Vet Dustin

Built 12 holes at Kalamazoo Country Club.
Built and greenskeeper Cascade Hills Country Club.

Stuart Dustin

Assistant Pro Cascade Hills Country Club.
Assistant greenskeeper Cascade Hills.
Built and Superintendent Shenandoah Hills Country Club, in Pontiac Michigan.
Currently working at Forest Hills Golf Club.

Larry Dustin

Worked at Shenandoah Hills.



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Ira Dustin

Worked at Cascade Hills.
Greenskeeper South Haven Country Club.
Helped build and currently working at Forest Hills.

Clare Dustin

Worked at Cascade Hills.
Pro/Superintendent at Bangor Country Club.
Assistant Pro at Kalamazoo Country Club.

Doris Dustin Axtell

Worked at Cascade Hills.
Worked with husband at States Golf Club,
Vicksburg, Michigan.
Worked with husband at Oakland Hills Golf Course,
Portage, Michigan.

(Lucien Axtell)

Owned States Golf Club.
Built and owned Oakland Hills Golf Course.

Bob Axtell

Manager, Oakland Hills Golf Course.

Ed Dustin

Worked at Plym Park Golf Course, Niles, Michigan.

Bob Dustin

Greenskeeper, Sauganash Country Club, Three
Rivers, Michigan.
Manager, Plym Park Golf Course.
Consultant to South Bend Country Club.
Consultant to Erskine Municipal Golf Course, South
Bend, Indiana.
Consultant to Morris Park Country Club, South
Bend, Indiana.
Engineered construction of Hampshire Country
Club, Dowogiac, Michigan.
Greenskeeper, Dowogiac Country Club.

Mabel Dustin Harris

Managed Plym Park Golf Course with husband.

Abe Dustin

Greenskeeper, Hastings Country Club.
Greenskeeper, Vicksburg Golf Course, Vicksburg,
Michigan.
Built and greenskeeper, Gateway Golf Course,
Kalamazoo.

Lee Dustin

Worked at Kalamazoo Country Club.
Greenskeeper, Berrien Hills Country Club, Benton
Harbor, Michigan.

Charter Member GCSAA.
Owned and built first nine holes Pipestone Creek Golf Course, Eau Claire, Michigan.

Bruce Dustin

Assistant greenskeeper, Berrien Hills.
Owned and built second nine holes, Pipestone Creek Golf Course.
Superintendent, Wyndwicke Country Club, St. Joseph, Michigan.

(Bonny Gregg Dustin)

Worked with husband at Pipestone Creek Golf Course.

David Dustin

Superintendent, Pipestone Creek Golf Course.

Darcy Dustin

Works in clubhouse, Pipestone Creek Golf Course.

Lori Dustin Jones

Golf shop manager, Pipestone Creek Golf Course.

(Jerry Jones)

Works on golf course at Pipestone Creek Golf Course.

Dudley Dustin

Worked at Kalamazoo Country Club.
Built and managed Wa-Kwi Golf Club, Paw Paw, Michigan.

John Dustin

Built six holes and greenskeeper at Kalamazoo Country Club.
Built and owned Hampton Lake Golf Course, Portage, Michigan.

Donald Dustin

Completed construction and Greens Superintendent Rozella Ford Golf Course, Warsaw, Indiana.

Jenny Dustin Goodwin

Lawrence Goodwin

Worked at Berrien Hills Country Club.

Frank Goodwin

Worked at Berrien Hills Country Club.
Built and superintendent at course near Cape Canaveral, Florida.

Del Dustin

Worked at Kalamazoo Country Club.
Built and greenskeeper, Ot-Well-Egan Country Club, Allegan, Michigan.
Built and greenskeeper, Hampton Lake Golf Course.

Derby Dustin

Greenskeeper, Ot-Well-Egan Country Club.

Hazel Dustin Dontje

(Charlie Dontje)

Built Arcadia Brook Golf Course, Kalamazoo, Michigan.
Built Lincoln Country Club, Grand Rapids, Michigan.



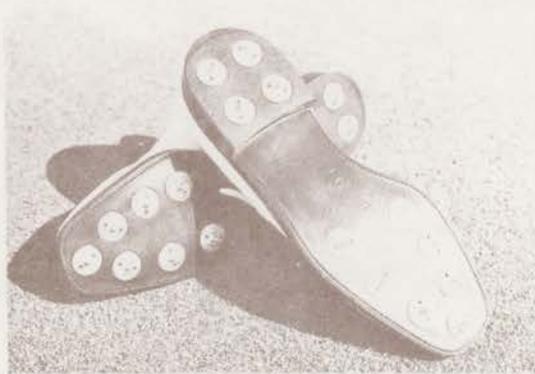
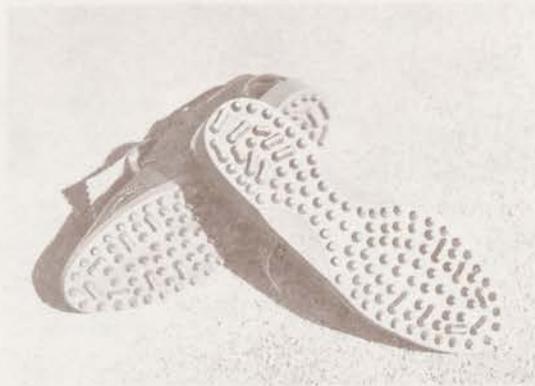
GOLF SHOE STUDY UNDERWAY
Credit: USGA Green Section Record

With the advent and active marketing of the rubber, multiple-stud-sole golf shoes in recent months, the Green Section has undertaken a study to evaluate the effect of two types of these shoes on turfgrass quality, wear, injury and putting quality. Two other types of golf shoes (the conventional metal-spike golf shoe and one of the new spikeless, lightweight golf shoes) are also included in the study.

The experimental plan was developed for the Green Section by **Drs. V.A. Gibeault and V.B.**

Youngner of the University of California, Riverside, and is being carried out at Industry Hills Golf Course, Industry, California. The experiment will be completed in mid-June. Statistical data and conclusions will be developed and published in the **GREEN SECTION RECORD** at the earliest possible date.

The Green Section has long held an interest in turfgrass injury and wear caused by certain types of gold shoes. Extensive experiments were carried out in 1958 and 1959 and the results published in Green Section publications of those years.



Future Dates

September 1, 1983, Field Day
Robert W. Hancock Turf Research Center

September 20, 1983
Northern Michigan Turf Conference
Traverse City Country Club

January 17 & 18, 1984
Michigan Turfgrass Conference
Long's Convention Center, Lansing, Michigan

credit MTF Newsnotes



HELPING YOUR GREENS RECOVER FROM HYDRAULIC OIL SPILLS

Credit: Golf Course Management

Due to the increased usage of hydraulic equipment on golf course putting greens, the frequency and severity of accidental oil spills have increased significantly.

These spills, (leaks) occur in one of several manners. They are caused by faulty valves, fittings, seals, pumps or ruptures in the hydraulic hoses. In many instances the damage goes unnoticed for as long as an hour before it is detected.

After it has been detected, every means possible is usually employed to try and neutralize the effects of the hydraulic fluid, most often by scrubbing with a detergent or by using an absorbant. Due to the volume of the leak and the time transpiring before it is detected the severity of the leak can cause damage from mild to extremely severe, requiring several weeks to several months before it is completely healed.

Over the past few years, a lot of information has been passed along, mainly in the verbal form, of the correct way to treat a hydraulic leak on a putting green surface. It was the objective of this study to determine what means proved most effective by using various detergents and absorbants over an elapsed time period, for the most rapid recovery of the oil damaged putting turf.

Experimental Procedure

The site chosen for this study was a four-year-old "Penncross" creeping bentgrass green maintained at a 1/4 inch mowing height. The green was located on a well-drained, Maury silt loam soil on the UK Spindletop Research Farm near Lexington, Ky.

All hydraulic oil treatments were applied by inducing a leak in both a front and back cutting unit, (the front unit leak was induced by rupturing the return hose from the reel pump, whereas the rear unit leak was induced by loosening a hydraulic fitting on the "input" side of the hydraulic reel pump) of a Jacobsen Greens King Triplex greens mower utilizing SAE 10W-30 motor oil as the hydraulic fluid. The mower was in hot running condition prior to each test application. The extent of damage varied somewhat between tests due to the amount of oil leakage induced.

The individual tests described were conducted on three separate dates: August 18, August 20, and October 27, 1981. All plots were five feet in length and were replicated three times. The corrective measures were applied directly onto the oil spill. This usually included an area 5 feet x 1.5 feet, per leak.

Experiment 1. Comparison of Dispersive and Absorptive Products

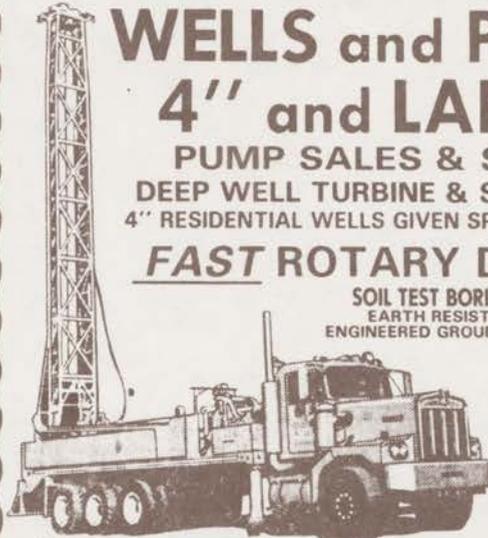
Fifteen minutes after the hydraulic oil application, (except as noted), all materials were applied to the

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surface. The liquid treatments were hand scrubbed with a sponge for two minutes, then washed from the plot area with a high pressure hose. The treatments were chosen to represent a broad range of detergents and absorbents and the results in no way constitute a brand recommendation. The treatments were:

- Ivory dishwashing detergent diluted 1:10 with water.
- Aqua-Gro non-ionic soil wetting agent diluted 1:50 with water.
- Cascade granular dishwashing detergent with approximately 0.1 pound dissolved in one gallon of water.
- Activated Charcoal—approximately 1/3 pound per plot.
- Calcined clay "fines"—approximately 3 pounds per plot. A sieve analysis of this material indicated approximately 80 percent held on a 1/2 mm sieve.
- Waterless hand cleaner, SBS-30—approximately 1/3 pound per plot.
- No treatment.
- No treatment. However, this plot was washed with high-pressure nozzle 6 minutes post-hydraulic leak.

Results

From the summary of damage ratings, it is deter-

mined that Ivory was the superior treatment. It is this writer's opinion that the calcined clay "fines" were a pleasant surprise in the testing and showed the best results after the Ivory treatment. Perhaps the most disappointing result was in the usage of the powdered charcoal. Not only was there no significant absorption of the hydraulic oil, but the plot areas were more unsightly and slower to recover from the initial injury.

Based on a score of 1 to 10, with "1" representing no damage and "10" representing most severe, the oil damage ratings as affected by corrective treatments using several dispersive and absorptive products are as follows:

Ivory -	3.7
Calcined Clay -	4.2
Cascade -	5.0
Agu-Gro -	5.4
Charcoal -	6.2
Hand Cleaner -	7.0
Wash -	7.1
Check -	7.5

Experiment 2. Evaluation of Washing Methods

Fifteen minutes after hydraulic oil application, Ivory dish washing detergent was applied using the following methods as treatments:

- Concentrated Ivory poured on plot, then washed with high-pressure hose.
- Ivory (diluted 1:10) scrubbed for 2 minutes, then washed with high-pressure hose.
- Ivory (diluted 1:10) scrubbed for 2 minutes, then sprinkled with water (not removed).
- Same treatment as "b" except the treatment was repeated two minutes.
- No treatment.

Results

The data indicated that there is no value in repeating the scrubbing treatment, and the total removal of the soap is not critical. It is likely that excessive scrubbing caused some physical damage to the turf. Where Ivory was applied in the concentrated form directly from the bottle, increased damage occurred immediately. The Ivory should be diluted.

Experiment 3. Timing of Wash Treatments

According to the following time schedule, Ivory diluted (1:10) was scrubbed onto plots for 2 minutes and then washed with a high-pressure hose. The "minutes" indicate time lapse between hydraulic leak and Ivory treatment.

	Average
a) 1 minute -	3.7
b) 5 minutes -	4.9
c) 15 minutes -	5.8

d) 60 minutes -	6.4
e) Check -	7.8

(The same method of rating the plot injury was used in all tests on a 1 to 10 scale).

Results

The above table shows that the Ivory should be applied as soon as possible after the leak. Time is of the essence. However, even after one hour, there was some improvement of recovery over plots receiving no post-leak treatment.

Experiment 4. Effects of Irrigation Applied After Spill

An industrial cleanser by Ashland Oil and Ivory were applied 15 minutes post-hydraulic leak, scrubbed for two minutes and then washed from the surface. Comparisons were made depending upon whether the green surface was maintained moist prior to applying the materials. This treatment simulated an operation (upon noticing oil leak) turning on the irrigation system while attempting to collect soap and other wash materials from the maintenance building.

The treatments were:

- Ivory (diluted 1:10)
- Globrite 3001 NC (diluted 1:16) scrubbed and washed.
- Plots sprinkled for 15 minutes post-hydraulic leak, then Ivory treated as in treatment "a."
- Same as treatment "c" except using Globrite 3001 NC.
- No treatment.

Results

Both Ivory and Globrite showed poorest recovery when applied to plots that had been sprinkled continuously to simulate irrigation.

General Discussion

Oil from a bad leak was obvious on the surface of the green immediately after application. The severity of damage did not become apparent, however, for about 48 hours. And the maximum turf loss occurred about two weeks post-treatment.

Where the oil was pulsating from the leak, only that area receiving the most oil was permanently damaged, especially if it received a good corrective treatment. To cause severe damage, it appeared that oil must reach the plant crown. A light mist of oil on the leaf surface caused little, if any damage if washed with soap.

When the leak was heavy, severe turf damage occurred regardless of the post-leak treatment. The beneficial effects of these treatments occurred by increasing the turf recovery rate. With the better corrective treatments, recovery became noticeable

within 20 to 30 days and the putting surface was not severely damaged. However with poor (or no) corrective treatments, the severe crown tissue kill caused exposure of the soil and therefore roughness in the putting surface. After 2½ months of excellent growing weather these severely killed areas had not begun to recover.

According to McGill, the oil present in the soil must be decomposed by soil microbes and depending upon the severity of the oil spill, this may require 1 to 4 years. However, he suggests the direct toxicity to plants, caused by the "light ends" of the oil, disappears within a month. The remaining oil prevents the soil from wetting, hence the soil dries out and will not support a viable root system or microbial decomposition, one should attempt to maintain good soil aeration, near neutral pH and adequate nutrients and moisture. Decomposition will then be the greatest between 55-85 degrees F.

Some hydraulic fluids recommended for mowers are lighter weight oil than the 10W-30 used in this test. This fluid is not as viscous and although it may cause more immediate damage, the turf recovery should be quicker. (Johns & Beard)

Although Ivory was the best corrective treatment used in these tests, it is presumed that any liquid, non-ionic high pH, no phosphate detergent could be used. Dishwashing detergent and hair shampoo would be good choices. However, it would be best to try the soap and concentration you select on a small area of green to determine potential phytotoxicity.

Summary

From the results of these tests conducted on creeping bentgrass, the following standard operating procedures should be implemented:

SOP for Hydraulic Oil Leaks

- 1) Mount a 2-gallon pressure sprayer with a coarse jet tip on each hydraulic mower. Also carry a large foam rubber sponge on mower.
- 2) Fill sprayer with approximately one quart of liquid detergent per 2 gallons of water.

If leak occurs:

- 3) Operator should quickly drive leaking mower off green into rough.
- 4) Operator should immediately spray detergent onto spill area and scrub as quickly as possible.
- 5) Use a hand-directed hose to wash spray material off green.
- 6) Maintain green as usual.

SOP (Optional) for Hydraulic Oil Leaks

- 1) Mount a 3-gallon container, with top, on each hydraulic unit.
- 2) Fill container with the "fine" grade of calcined clay.

If leak occurs:

- 3) Operator should quickly drive leaking mower off green into rough.
- 4) Operator should immediately hand sprinkle the calcined clay directly onto the oil.
- 5) As the clay absorbs the oil and becomes dark in color, additional clay may be needed.
- 6) After an hour or so, remove the calcined clay with a vacuum or by washing from green surface using high-pressure hose.
- 7) Maintain green as usual.

This test was initiated with the help and supervision of Louis Miller, Louisville Country Club, and Grady Stone of Tieco, Inc., Louisville. Additional help was received from Wes Downing, Lexington Country Club; Linda Tapp, UK Research Technician; and Barry Bridges, UK Agronomy Graduate Student. Advice received from W.E. Whitlock, Ashland Chemical Company, was also appreciated.

References

- 1) *Effects and treatments of Petroleum Spills on Bermudagrass Turf.* D. Johns and J.B. Beard, *Agronomy Journal* 71:945-947, 1979.
- 2) *Oil Spills.* W.B. McGill. *Crops and Soils Magazine.* October 1978.



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SOME OF THE PROBLEMS

Take IBDU as an example. Its water solubility increases by $\frac{1}{3}$ from 40 degrees to 80 degrees Fahrenheit. This might not be too bad for warm-season grasses, although it does mean the long lasting qualities are reduced. However, it could be disastrous to cool season turfs where reduced, rather than increased, nitrogen availability is wanted during hot weather.

Sulfur coated urea (SCU) has the same problem. As temperatures increase, water becomes a better solubilizing agent, thus promoting faster — sometimes much too fast — release.

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Cost is yet another factor with the synthetic nitrogens. They have gotten so high that they are seldom sold in pure form. They are instead included in mixtures with fast acting urea (the inferior source in most comparison charts) and often potassium and phosphorus, as well. This lowers the analysis but increases the "burn" potential.

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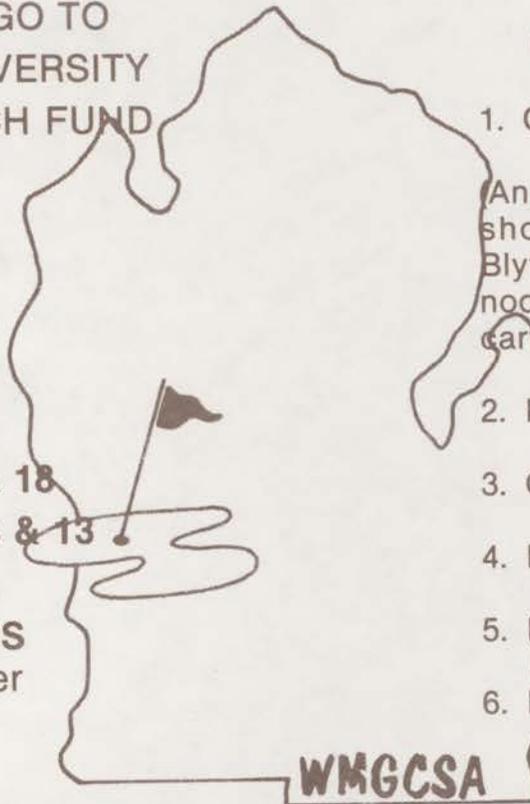
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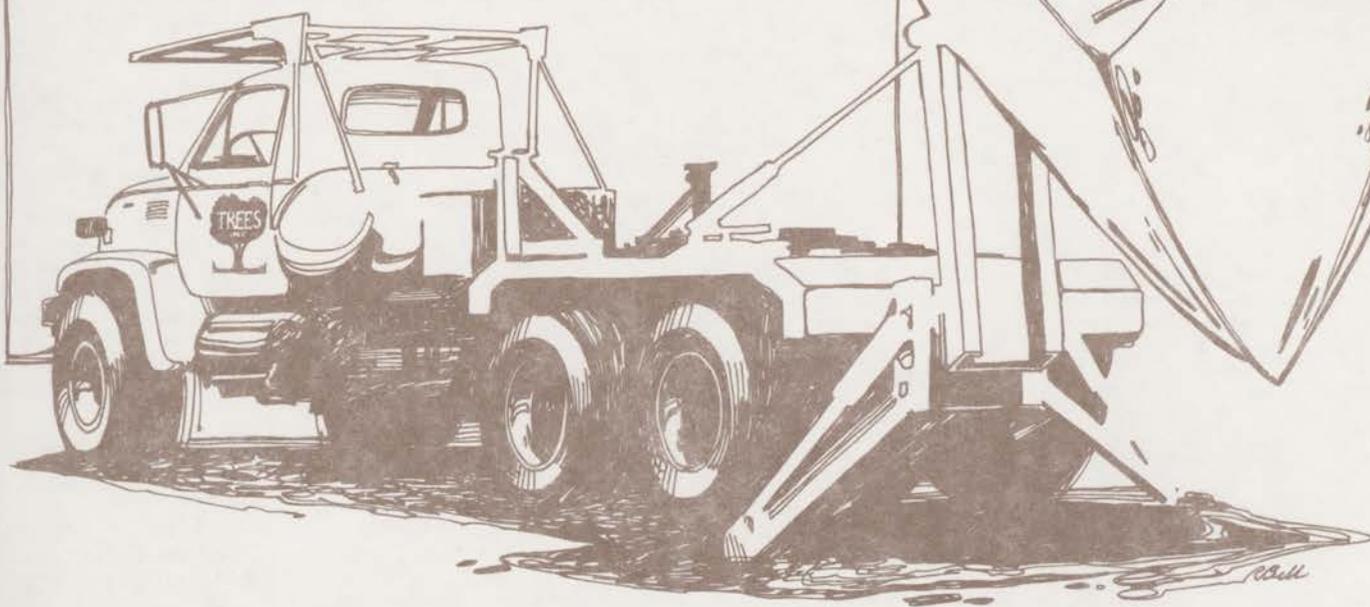
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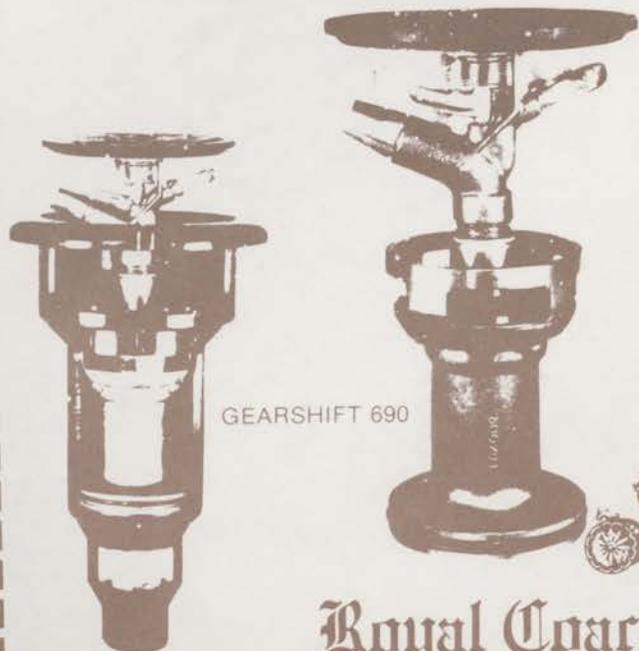
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70	173 45.0	184 57.0	197 74.3	203 78.8	210 90.4	220 109.2	232 129.3
80	178 47.9	190 60.9	203 79.4	209 84.1	216 96.5	227 115.4	240 136.6
90	183 50.9	196 64.7	211 84.1	215 89.2	223 102.3	234 121.8	248 144.6
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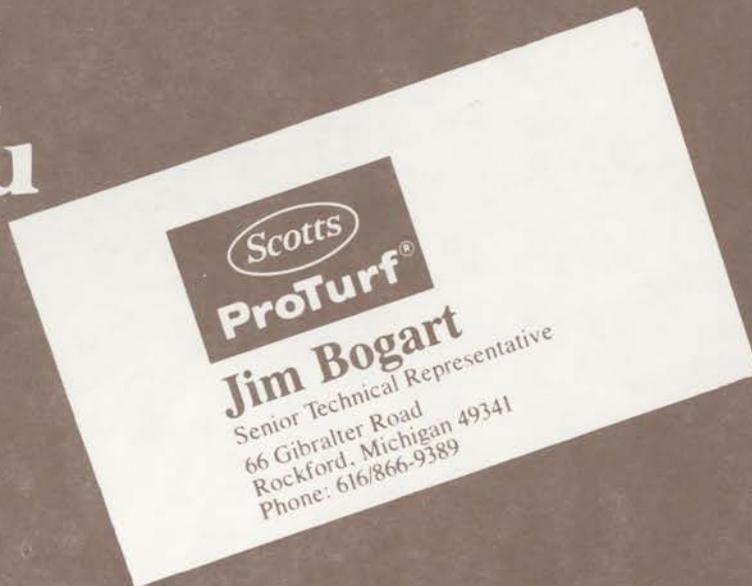
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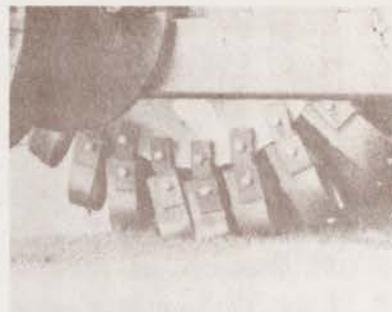
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