

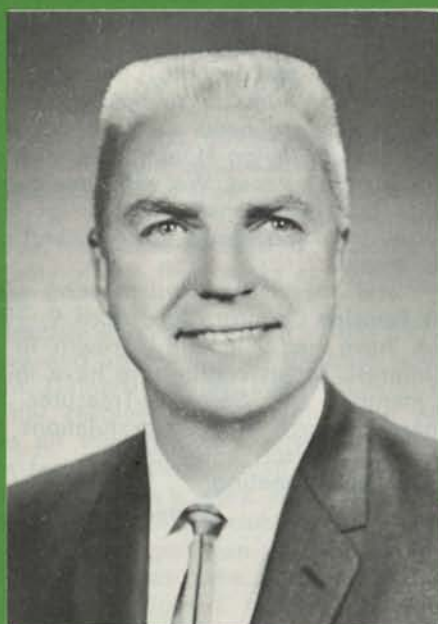
APRIL, 1968
VOL. 21. NO. 11



The Bull Sheet

Official Bulletin

Midwest Association of Golf Course Superintendents



ROY NELSON
M.A.G.C.S.
Secretary & Treasurer

APRIL MEETING
RAVISLOE COUNTRY CLUB
First Golf Outing
APRIL 9, 1968

ARTICLES

1. It's What's Up Front That Counts
2. Holmes Corner
3. Measuring Toxicity of Pesticides
4. The Pennsylvania Turfgrass Council, Inc.
5. Sulfide Compounds Contribute to Leaks in Cast Iron Pipe

DICK TREVARTHAN, Editor
122 Evergreen Drive
Frankfort, Illinois 60423

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The President's Message

With the coming of April we will all be very busy for several months to come. It is an opportunity though for us to put into practical use some of the things we have learned from the Turf Meetings and Conferences that we have attended.

Many Midwest Superintendents have just attended Turf Conferences in Indiana and Iowa. Both Conferences were well attended. I attended the Conference in Iowa. I was on the program on a panel discussion of turf disease. Subject being "Disease Identification."

April is the month for man power shortage. I hope this year will be better. Semi-private golf courses run into a problem of golfers wanting to play golf when the frost is going out. All we Superintendents can do is say "No" until we know the ground is ready to take all the traffic and etc. it will be subject to.

As this message goes to press we will not have had our meeting at the Clayton House. I'm sure our meeting there will be a success. We will have gained much knowledge from Mr. James Freeman of Freeman Nurseries on Tree and Shrub Planting and care in the Chicago area.

Let us all try and attend the April meeting which will be held at Ravisloe Country Club, April 9, 1968. In the past we have had a healthy growth in enthusiasm and interest. Let us continue to have this.

Our good member and Secretary-Treasurer Roy Nelson was married March 9th. Congratulations and best wishes to Mrs. Nelson and Roy.

See you at the April meeting.

Walter H. Fuchs,
President



Mr. Jim Freeman — Featured speaker at the March meeting of the M.A.G.C.S.

Jim's talk was highlighted by a movie showing a machine capable of moving a tree 12" to 16" in diameter, with a ball 8' by 4', weighing approximately 8,000 lbs. The cost being about \$100.00 per tree and taking about 1½ hours to move to another place on your golf course. Comparing this to moving the same tree by hand, it would take 76 man hours.

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TO ALL M.A.G.C.S. MEMBERS WIVES

Mrs. Walter H. Fuchs, the wife of the M.A.G.C.S. president Walter, is inviting all wives of M.A.G.C.S. members to attend a dinner, at a designated place, sometime in early May. If you are interested, please call Mrs. Fuchs at **312-257-2869**. This would be to talk over the forming of a club, that would meet once a month, for all M.A.G.C.S. members wives.

IT'S WHAT'S UP FRONT THAT COUNTS

Tom Mascaro

The credit for suggesting a title for this presentation of thoughts goes to Tom Burrows. It's a good one and brings into focus a very important aspect of the responsibilities of the golf club superintendent.

Much emphasis has been placed on the grooming of the golf course to produce the best turf and playing conditions possible. This is as it should be since the very existence of the club revolves around the golf course. Unquestionably the grooming of the course and its excellence in playability determines the success of the club organization. This condition, of course, is the prime responsibility of the superintendent of the club. However, it has become more and more apparent that there are other responsibilities which, when fully assumed by the superintendent, round out his position as a true executive of the club's operating organization.

This responsibility is up front and in many instances this is where it counts.

After all, not all the members play golf. A portion of the membership enjoys only the club house facilities. Their desire to belong to the club is not based on the excellence of the golf course. Enjoying the club house facilities certainly includes its outside appearance; namely, the entrance, the parking lot, and the lawns and landscaping around the club house.

Actually the excellence of the grounds surrounding the club house affects the attitude of all the members. If the golf course itself is great, the golfing members may overlook a shabby club grounds appearance, but they will certainly demonstrate more pride if they are pleased with what they see as they enter the club grounds.

Another important aspect is the impression upon guests when they visit the club. Every member takes great pride in everything related to his club. He likes to show it off to his guests. He points with pride at the beauty and grooming of his club the minute his car turns into the driveway. We also must assume that if the whole picture assumes a shabby, unkempt appearance, he makes a mental note that someone ought to be replaced. Perhaps more times than we realize, this mental note is loosened and released verbally after a few drinks at the bar or in the locker room.

Another important aspect of this picture is the condition and appearance of the club house grounds at night. Dinners, parties, banquets with guests present usually revolve around night time activities. What does all this look like when the sun goes down? Let's face it—a very human inclination is to go home after a hard day's work and forget the whole thing. Is it possible that the club house has not been visited at night for longer than you can remember? It's possible. Here is an area of responsibility that should really be investigated. Is the lighting adequate? Are you taking advantage of the fabulous effects that indirect lighting will produce—both winter and summer? Are there great puddles that must be watched out for or loose stones that trip people and ruin "my lady's slippers"? Does the kitchen fan blow the aroma of rancid grease in your face as you walk by or do you find yourself with one foot in a half filled garbage can as you round that dark corner from the parking lot? Dead bushes look terrible at night and wilted petunias look worse.

The golf club superintendent who recognizes his responsibilities "up front" is in turn recognized by every member of the club. Word gets around fast that "here is a man who cares about our club."

Assuming these responsibilities "up front" can be and is rewarding in many ways. Recognition that you exist in the club organization and the praise you receive for these efforts produces a warm feeling that money can't buy. Recognition and importance go hand in hand with job security and salary increases. You will find that a closer relationship will develop between you and the membership. It is obvious, too, that a much closer and pleasant relationship develops between the executive operating team of the club; namely, yourself as golf club superintendent, the pro and the manager.

All in all this whole concept of "What's up front that counts" can be summed up very easily.

It's not hard to get the answer. Simply dress up like a member. Ask your wife (or girl friend) to dress up in her best, too. Then take a ride. Visit your own club. Make two visits, one in daylight, one at night. If you and your lady are proud of what you see, you can throw out your chest and take her to cocktails and dinner. If you both are not impressed with what you see, your best bet would be to go back home, have her cook some hamburgers while you get into some comfortable clothes and after gulping down your dinner, make yourself comfortable at the drawing board and begin planning.

FROM JOHN HUSAR — THE LOCKER ROOM The Chicago Tribune

The area's golf course superintendents are back from various national and regional turf conferences and ready to put their layouts into final shape for the coming season. Uppermost in their minds, however, is the increasingly difficult problem of finding enough workers for maintenance staffs.

It's no longer easy to hire competent men who are willing to work demanding hours on a seasonal basis for minimal pay by present-day standards, according to Ben J. Chlevin, executive director of the Golf Course Superintendents Association of America.

"So many golf courses regard labor as it was in the 1930's," Chlevin said, "when unskilled workers were satisfied to work from April to October or November and then disappear until next year. Today we have to think in terms of job security and fringe benefits to keep these men interested."

Most experts agree that a golf course needs at least one maintenance man for every two holes. Many employ students during the summer, but have had trouble keeping them on the job as fall approaches.

"Let's face it," Chlevin said, "the only good things about these jobs is that they're outdoors, clean, and in beautiful surroundings. Everything else is against them—the hours, the days, the wages, and so on."

Without adequate labor, superintendents are finding their talents stretched to meet demands for improved facilities, Chlevin contends. They are using bigger and better machines, but fewer men are around to do the other work.

"There now is a lag—and it has grown quite sizeable—in what the superintendent is trying to do and what he has the means to do," Chlevin said. "It all boils down to the nightmare of 'wondering if he'll be able to keep that night watering man, with those ungodly hours—especially if he's a good man.'"

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HOLMES CORNER

by James L. Holmes
USGA Green Section
Mid-Western Agronomist

I thought the conference and show in San Francisco was simply great—in the hotel and on the streets. Shades of topless and bottomless.

I learned while attending the Iowa Turf Conference, March 4, 5 and 6, that desiccation has developed into a serious problem throughout Iowa and the Dakotas this past winter. At the present time, most golf course superintendents are applying up to 500 gallons of water per green by tanking it onto the golf course. A few superintendents have actually gambled to the extent of irrigating greens with the watering systems, then draining them back immediately. Without question, many watering systems in this area are going to be placed in operation much sooner than normal. If desiccation continues to be a problem, the practice of placing brush and surrounding greens with snow fence may gradually extend further south than Minnesota where such practices are common.

I have repeatedly observed throughout the Midwest, that a disease condition caused by various species of **Fusarium** can be and usually is excessively damaging in late winter and early spring. I have come to the conclusion that **Fusarium** is the most damaging fungus with which we deal and perhaps kills more grass throughout the Midwest than all other disease-causing fungi put together. It is of extreme importance that a suitable **Fusarium** control fungicide be applied at this time of year. Perhaps, this is one of the key fungicidal applications which can be made. If anyone in the Chicago area or throughout the Midwest omits this treatment, it is probable that turf will be slower to "come in" and form suitable putting conditions. Microscopic examinations repeatedly show the presence of various types of **Fusarium**.

I have received numerous letters regarding play of the golf course in late winter and spring; most such letters from private country club members. Considerable has been written and talked about regarding damage which can result from late winter or early spring play, most of which can be summarized as follows:

1) Do not play when the soil is saturated with water or over-wet. This means that shoes actually sink through the soil or carts leave ruts. Not too often does this condition prevail.

2) Do not, and this is of paramount importance, walk on grass when a "white frost" is visibly present. When this is done, ice crystals in the cell vacuole will cause cell wall rupturing and death to the plant.

3) Never allow traffic on soil, especially putting greens, when the soil is frozen but the upper 1 to 2 inches have thawed. This can cause permanent damage to turf, as well as develop rough, bumpy putting conditions.

During the past week I have observed serious damage to greens on two golf courses where play was allowed and the phenomenon discussed in 3 above was in effect. It seems to me, that "thaw-frost" damage can be as serious as damage resulting from traffic allowed on greens when white frost is visible. One thing that we must remember is that the golf course belongs to the membership and if they insist on playing, I suppose they must be allowed to do so. However, every effort must be made to inform the membership of the damage which will result if greens are allowed to be played when, indeed, they should not be.

I see absolutely no evidence of winterkill or serious damage throughout the greater Chicago area this spring and let's hope we have another good turf spring and summer this season.

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MEASURING TOXICITY OF PESTICIDES

by Stanley Rachesky
Extension Entomologist
University of Illinois

In the next month or so spraying of toxic materials will begin again. Why are some insecticides more toxic than others? How is toxicity measured?

Let's look at a few of the insecticides that are used and find the how and why of toxic insecticides.

The University of Illinois recommends five basic insecticides. These chemicals will control just about all insect problems. They are:

Sevin (carbaryl) LD-50

acute oral 500-850 mg/kg
acute dermal 4,000 +

Chlordane LD-50

acute oral 335-430 mg/kg
acute dermal 690-840

Diazinon LD-50

acute oral 76-108 mg/kg
acute dermal 455-900

Malathion LD-50

acute oral 1000-1375 mg/kg
acute dermal 4444 +

Pyrethrin LD-50

acute oral 820-1870 mg/kg
acute dermal 1880 +

The simplest way of expressing the toxicity of a compound is by means of an LD-50 value. Such a value is a statistical estimate of the lethal dosage (LD) necessary to kill 50% of a very large population of test animals. Acute oral toxicity ratings are usually obtained by feeding white rats and acute dermal ratings by skin absorption tests in rats or rabbits. LD-50 is expressed in terms of mg/kg. This is the number of milligrams of actual insecticide per kilogram of body weight of the test animal.

To express toxicity in practical terms the factor 0.003 times the LD-50 value will give the ounces of actual insecticide required to be lethal to one of every two 187 pound man or other warm-blooded animals. As an example, the oral LD-50 value for malathion is 1200 mg/kg, therefore, if a group of men each weighing 187 pounds at 3.6 ounces (1200 x 0.003) of actual malathion per man 50% of them would die. The dermal toxicity LD-50 value of malathion is approximately 4000 mg/kg or for a 187 pound man (4000 x 0.003), 12 ounces.

By comparison, the oral LD-50 value of aspirin is 1200 mg/kg or (1200 x 0.003) 3.6 ounces per 187 pound man, the equivalent of malathion. To give a further comparison, the oral LD-50 value of ethyl alcohol (95% or 190 proof) is 450 mg/kg or (4500 x 0.003) 13.5 ounces. If a group of 187 pound men each consumed somewhat more than one quart of 80 proof whiskey in 45 minutes they would not only be intoxicated but 50% of them might die.

Toxicity varies with sex, age, weight, health, etc. Therefore, the LD-50 values presented here must be applied with caution. However, LD-50 values are useful in making an objective comparison.

A good general guide to follow:

acute oral LD-50	LD-50 for a human adult
50-500	1 tsp. to 2 tbsp.
500-5000	1 oz to 1 pint
5000-15000	1 pint to 1 qt.

Let us not lose the proper perspective. These LD-50 values are for 100% strength materials. The LD-50 values for the commercial products can be anywhere

from 3/4 as toxic to almost 100 times less toxic. For example, chlordane is sold anywhere from 10% dust to a 74% emulsifiable concentrate. Sevin is available as a 50% or 80% wettable powder, diazinon is a 25% emulsifiable concentrate, malathion as a 50-57% emulsifiable concentrate and pyrethrin as a 1/3% space spray.

Let's take Sevin sold as 50% wettable powder. The acute oral LD-50 for the 100% strength material is 500-850 mg/kg. As a 50% wettable powder the acute oral LD-50 would then be 1000-1700 mg/kg or 1/2 as toxic and require twice as much material to cause concern.

Think Pesticide Safety

1. Read the label. The most important 4 minutes in pest control is the time it takes you to read the label.
2. Do not smoke while handling pesticides. Some are quite flammable.
3. Apply correctly to label specifications and only when necessary. Don't over apply.
4. Avoid inhaling fumes, mists, dusts.
5. Wash off contaminated skin with soap and water. Many insecticides are contact poisons and can be easily absorbed through the skin, especially the eyes.
6. Store pesticides in the original containers and under lock and key. It is better to be safe than sorry especially with all the children roaming around.
7. Destroy empty containers. Break bottles and punch holes in cans to prevent reuse. Paper containers should be burned, being careful not to inhale the fumes while doing so.



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At the recent Greens Superintendent meeting at the Clayton House, a presentation was made by Illinois Lawn Equipment, the distributor for the new Milbradt Omego Mower.

The award was made to Mr. Lindo (Butch) Bernardini for his wife Angie, who was the winner of the very fine tape player. Butch is the superintendent of Knollwood Country Club in Lake Forest, Illinois.

Mrs. Bernardini was the lucky winner over the many who entered at the national show; however, the drawing and announcement was not held until this month.



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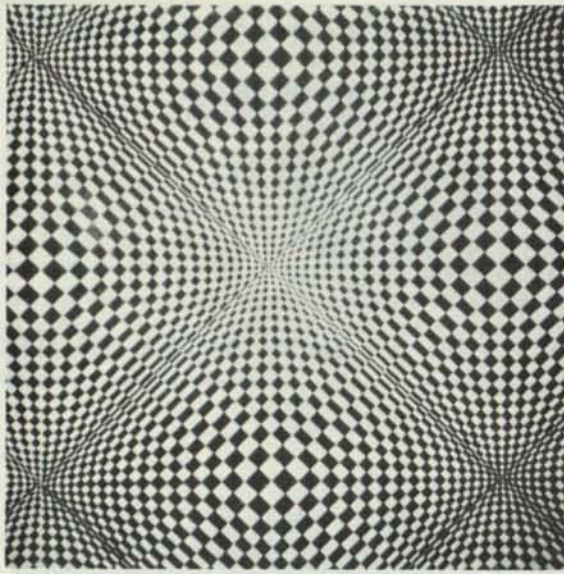
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Al Bertucci and Julius Albaugh. Many thanks to Julius for taking the many fine photographs at the G.C.S.A. Convention in San Francisco.



Doug Jabaay, Ted Sokolis and Bert Jannes.



Toney Meyer, Charles Schultz, John and Kenny Lapp.

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VOTING DELEGATES REPORT

To: Mr. Walter Fuchs, President M.A.G.C.S. and General Membership.

From: Oscar L. Miles, M.A.G.C.S. 1968 Voting Delegate to the G.C.S.A.A.

Subject: G.C.S.A.A. Voting Delegate Report.

The first delegates meeting was held Monday, February 19, 1968. Mr. Sherwood Moore, nominating committee chairman called the meeting to order. Mr. Moore had a few general comments and he then introduced Mr. Robert M. Williams, the 1968 election committee chairman. Mr. Williams thoroughly explained the correct voting procedure and discussed the material content of the special "Blue Ballot", amendments to the by-laws. Mr. Williams then returned the meeting over to Mr. Moore's leadership. Mr. Moore then proceeded to introduce each candidate selected by the nominating committee for the directors slate. Each candidate was allowed five minutes to give a short biography and to express any ideas that he might have concerning the operation of the national if he were elected to the board of directors. The first meeting was adjourned until the following day.

The second delegates meeting was called to order by Mr. Moore again. All nominees for directors were excused from the room for open discussion of each candidate. Each voting delegate from a chapter that had a member up for election was then asked to give a short speech about their respective candidate. Meeting was adjourned until the 40th turfgrass conference in Miami Beach, Florida.

For two and one-half days, your official delegate was very busy attending delegate meetings, checking our roster for voting strength, visiting with other chapter delegates and discussing very openly the slate for officers and directors. A caucus of the M.A.G.C.S. was held Wednesday, Feb. 20, 1968 at 11:15 a.m., 30 minutes before the national secretary's office closed. Your official delegate informed the members present at the caucus of the 22 member votes pulled from our block that would be voted by proxy. Our voting strength was reduced to 100. Concerning the "Blue Ballot", the membership, at the caucus, approved voting yes on the first option and no to the second option.

Your official delegate voted for the following at the annual election:

for president — James Brandt
for vice-president — John Spodnik
for directors (3) — Ted Woehrle, Norman Kramer and Richard Blake

The following candidates were elected to the offices and directorships:

for president — James Brandt
for vice-president — John Spodnik
for directors (3) — Norman Kramer, Stanley Clarke and Richard Blake

I am sorry that our candidate Mr. Ted Woehrle was not elected to the board.

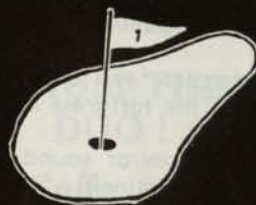
I would like to thank every member that supported me and also the ones that gave me sound advice, knowing that this was my first venture for our chapter on the national level.

Respectfully reported,
Oscar L. Miles
Official Delegate
M.A.G.C.S.



Oscar Miles — speaker and voting delegate at the G.C.S.A.A. Convention in San Francisco.

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THE PENNSYLVANIA TURFGRASS COUNCIL INC.

Organization

The Pennsylvania Turfgrass Council is a non-profit, independent organization, legally chartered by the Courts of the State. It is composed of duly certified representatives from trade and other organizations, departments of the State Government, and industries, in each of which some phase of turfgrass production or management is an important part of their operations.

Technical Advisory Committee

The Council depends for advice on technical matters relating to turfgrass production and management on a Technical Advisory Committee composed of all Staff Members of the Pennsylvania State University who are actively associated with research, resident instruction, and extension service, in the turfgrass field. Dr. J. M. Duich is chairman.

Objectives

The rapid expansion of interest in, and use of turfgrass on hundreds of thousands of acres in lawns, athletic fields, roadsides, parks and playgrounds, golf courses, and other areas, has created an ever increasing demand for sound and specific information on the many problems incidental to turfgrass establishment and maintenance. It also has created a very large actual, and even greater potential market for equipment, seed, fertilizer, soil modifying materials, chemicals, and other products and services used in turfgrass production.

Huge sums of money, in aggregate, are spent annually on the establishment and maintenance of turfgrass areas. The quality of the turf on many of these indicates that too large a proportion of the total outlay is not used to the best advantage, because of a general lack of understanding of the basic principles and their practical applications, which are fundamental to good turf production.

The Pennsylvania Turfgrass Council was formed and has undertaken to meet this challenge. Its major objectives are:

1. To collect and publish complete and accurate information on the extent of the turfgrass industry in the State.
2. To inform the public of sources of sound information and how it can be obtained.
3. To encourage and support publication of needed information by educational and research institutions.
4. To advance research and technical education in the turfgrass field by support (financial aid and otherwise) of a strong research and education program at the Pennsylvania State University, by grants of funds from monies the Council collects for these purposes.
5. To support in every possible way the technical training of professionals in turfgrass management.
6. To lend support and assistance in the formation of local turfgrass associations.
7. To fully examine the critical evidence of the value and usefulness of consumer products, and disseminate the results of findings through publications of bulletins, news releases, and other means.
8. To urge state educational, research, and regulatory institutions to provide regional facilities and additional manpower to properly service the turfgrass field.

9. To cooperate with similar organizations in other states to secure broader recognition of the importance of the turfgrass field, and greater uniformity in recommendations on the many phases of production and management.
10. To confer with industry on ways and means of securing more widespread use of good equipment, quality materials, and recommended practices.

Accomplishments

1. The Council promoted and partially supported the first complete survey of the turfgrass industry in Pennsylvania. The survey was conducted by the Crop Reporting Service, Pennsylvania Department of Agriculture. Results have been published in special Bulletin CRS-42, 1966 TURFGRASS SURVEY.
2. A complete list of all available publications by the Pennsylvania State University on turfgrass production and management has been placed in the hands of all Council members for reference to the membership of their individual organizations. Distributed press releases on topics of timely interest in the turfgrass field.
3. Major publications prepared and distributed by the Council include:
 - a. A guide for preparation of specifications for Turfgrass Establishment.
 - b. Directions for Organizing and Conducting a Turfgrass Association.
 - c. The ABC of Crabgrass Control.
 - d. Biennial Brochures on Council Organization & Activities.
4. The Council sponsored the following research projects being conducted at the Pennsylvania Agricultural Experiment Station, and granted funds for their support in the amount of \$114,200.00.

Soil Modification	\$39,500
Nitrogen Availability	32,500
Herbicide Studies	24,900
Disease Control	17,300

The Council also has contributed \$2000 in support of the Turfgrass Survey, and \$600 for enlargement of the research service building and establishment of the Valentine Memorial.

5. The Council assisted in organizing turfgrass curricula in Technical High Schools and in development of a training manual for VoAg teachers of turfgrass courses.

We have sponsored the Annual Turfgrass Conference at the Pennsylvania State University in collaboration with the Department of Agronomy.

We have fully supported the development and expansion of the Winter Course (2 yrs.) at the Pennsylvania State University for training students in practical turfgrass management on the golf course and other extensive turfgrass areas.

6. The Council has provided direct assistance in formation of 2 local turfgrass associations.
7. The Council inaugurated issues of quarterly bulletins to disseminate useful information to Council members.
8. The Council has prepared a program of increased facilities and manpower and is presenting it to the proper authorities.
9. The Council is aiding other Turfgrass Associations to obtain surveys of the extent of turf in their states.

Grants and Gifts

The activities of the Council are supported entirely by grants and gifts from individuals, organizations, and

industries, who recognize the need for, and value of the program which has been undertaken.

The business of the Council is conducted by the Officers, the Board of Directors, and Standing Committees, with the approval of the Membership. No officer or other member of the Council receives a salary or other remuneration. This permits the use of the entire resources of the organization for support of research and other activities that will promote the objectives of the Council.

Applications for membership on the Council by qualified Pennsylvania organizations are welcomed and will be given every consideration. No initiation or membership fees are assessed.

Grants of funds can be made either for a specific purpose, such as support of a specific research project, or for the furtherance of the general program of the Council. All grants are made under a firm Memorandum of Agreement which obligates the Council to apply the funds only to the specific purpose as stated in the memorandum.

Note: Editor —

There has been no survey made in a midwestern state. Illinois would be a logical state. According to Mr. Grau it would take a lot of planning and organization to make it work the first time. After that it would be a routine thing through the Crop Reporting Service. All other crops are surveyed annually by C.R.S. on a tax-supported basis—why not turf?

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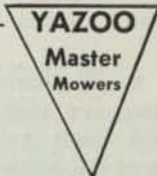
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SULFIDE COMPOUNDS CONTRIBUTE TO LEAKS IN CAST IRON PIPE

In July 1967 Mr. William "Bill" Hargrave, superintendent of Kankakee Country Club, experienced several leaks in his cast iron irrigation system. Cast iron pipe was installed at Kankakee Country Club in 1963. Several of these leaks appeared under greens and tees. Bill decided to bring the "Cast Iron Pipe Research Association" in.

After all the tests were conducted Bill was quite relieved to find that soil conditions, which caused a leak under his 16th green, were not present in all cases.

The following test procedures and conclusions were made by the "Cast Iron Pipe Research Association".

Procedure

Representative test locations were selected by Mr. Hargrave near tees and greens. At each location, certain basic soil analyses were accomplished. Soil samples were removed for the following analyses: pH, oxidation-reduction potential (Redox), sulfides, soil and moisture description and other examinations. In addition, earth resistivity on the subsoil was determined at each location. Soils encountered at the selected locations and depths were generally moist to saturated. In turn, the adequate soil moisture placed soluble soil salts into solution so that the resistivities measured represent the lowest values to which such measurements would decline.

Earth resistivity is a measure of the ability of the soil to serve as an electrolyte, and is an important means of assessing the corrosivity of the soil relative to the development of local corrosion cells or the transmission of stray direct current.

pH is used to indicate the balance of acidic or basic constituents in the soil. pH seems to be important in three general ranges:

0.0-4.0 6.5-7.5 8.5-14.0

In the first, or acid range, soil serves well as an electrolyte when moisture is sufficient. The neutral range is optimum for bacteriological sulfate reduction if other conditions are appropriate. In the high, alkaline range, dissolved salts are prevalent and a low resistivity is normally observed.

The oxidation-reduction potential (Redox) of the soil is important because the most common sulfate-reducing bacteria thrive under anaerobic conditions.

An increasing redox potential above +100 mv. indicates increasing soil aeration and a decreasing support for the life processes of the sulfate reducers. As the redox potential decreases from +100 mv. to 0 mv. the oxygen level of the soil approaches near anaerobic conditions with increasingly favorable conditions for the growth of the sulfate-reducing bacteria. Negative redox values definitely indicate anaerobic conditions under which sulfate-reducers may thrive providing other conditions are also favorable.

Sulfides in a soil sample catalyze a reaction between sodium azide and iodine. One of the results of the reaction is free nitrogen which evolves in the test tube with resultant bubbling or foaming. The results of the sodium-azide iodine test are placed in three categories for reporting purposes: Negative, trace, and positive.

When sulfates in soil are reduced by sulfate-reducing bacteria under anaerobic and near neutral pH conditions, the by-products of the metabolism of these

bacteria include sulfide compounds which serve as excellent electrolyte material conducive to development of corrosion cells. They also serve as depolarizing agents furthering the continuance of activity of such local cells. Anaerobic sulfate-reducing bacteria thrive best at soil temperatures above 50 degrees F. and at a pH of 7.0. They become less active at lower temperatures and as pH departs from 7.0.

Each soil sample is described in the report in order to develop any correlation between soil type and corrosivity. The moisture content is noted because prevailing moisture is extremely important to all soil corrosion.

Conclusion

The soil description varies considerably over the golf course. This is due to the greens and tees being built up of material either dug from a nearby pond or brought in from a clay borrow pit. They range from a brown clay to a dark gray to black clay. All of the samples were moist to wet at pipe depth. Earth resistivities were very uniform over the entire project. Sulfides were present at several locations on the course. The soil at these locations evidently was taken from the pond during the construction of the new tees and greens. The material from the pond has not been placed around the pipe on all of the new greens and tees as had originally been thought to be the case.

Pipe corroded at two locations due to the presence of sulfides, neutral pH and low oxygen level.

The irrigation system is a closed system, that is, there is no tank on the system to take the initial surge during the start up of the pump or stopping of the pump.

Recommendations

Therefore, it can be concluded that the frequency of breaks should decrease. If actual field conditions prove to the contrary several steps can be taken.

First, the system should be provided with a tank or slow opening and closing valve. This would prevent water hammer damage to the system, since the two breaks to date have been in dead end portions of the system. If the breaks continue to occur at a rate wherein the greens and tees are being torn up, then replacement of the pipe should be considered. If the pipe is replaced, it should be wrapped with an 8 mil thick polyethylene tube.

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EXPRESSWAY

Ken Quandt, Glencoe Country Club, is rebuilding #4 green and #17 tee. Also, plans have been completed to finish the fairway water system. — Mike Bavier, Calumet Country Club, says they have built a new cart shed and a new Pro shop, along with remodeling the clubhouse. — Flossmoor Country Club has built a new storage building and cart shed. — Peter Voykin, Idlewild Country Club, is doing well after a tonsillectomy. — Brother Andy Voykin is operating a driving range at Half Day Road and Milwaukee Avenue, along with the Flying Carpet operation. — The main irrigation lake has been dug out to a greater depth at Evanston Country Club. Bruce Sering says the fill will be used for 45,000 sq. ft. driving range tee, 6 practice target greens and Berms built to screen the range off from the golf course. — Bill Douglas has completed his first year at Penn State University. He will continue to work at Evanston Country Club. — Harold Frederickson, Edgewood Valley Country Club, has all redwood furniture around his tees including ball washer stands. — The George A. Davis Co. is happy to announce that Mr. Peter Nason has joined their staff as an irrigation specialist. — Oscar Miles, Olympia Fields Country Club, has rebuilt 4 tees on his north course.

Itasca Country club, one of several west suburban courses hampered by floods last year, has built a dike to keep the waters of Salt creek off its property. Golfers will have to clout the ball over the hazard to reach the 15th green, which—along with several other areas—has been elevated.

Elmhurst, also near the flood area, has rebuilt its 10th fairway and Medinah has improved the first and sixth greens on its famous No. 3 course.



Jimmie Bertucci, son of Mr. and Mrs. Adolph Bertucci, is headed for Viet Nam. Jim is a Lt. in the U. S. Air Force.



Ronnie Rosset, Mrs. Julius Albaugh, Mrs. Ronnie Rosset, Dudley Smith, Jim Burdett.



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