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The Bull Sheet

Official Bulletin
Midwest Association of Golf Course Superintendents

APRIL MEETING

(Tentative Date April 9th)

RAVISLOE COUNTRY CLUB

HOMEWOOD, ILLINOIS

ARTICLES:

1. Plastic Covers For Winter Protection
2. Holmes Corner
3. Fertilizers and Drought
4. Fireflies or Cutworms
5. Dutch Elm Disease

THE BULL SHEET, official publication of THE MIDWEST ASSOCIATION OF GOLF COURSE SUPERINTENDENTS.

DICK TREVARTHAN, Editor
122 Evergreen Drive
Frankfort, Illinois 60423

TOM BURROWS SPEAKS AT PENN STATE*

Penn State held its 36th Annual Turf Conference, January 15-18th, and dedicated the symposium to the memory of Marshall Farnham. Over 400 dedicated turf men drove through snow and sleet to this annual meeting in the Nittany Mountains.

Tom Burrows, Superintendent at Ravinia Greens, spoke for 45 minutes on the topic, "From Student to 36 Holes." Tom related his experiences from Peoria, Illinois through succeeding positions at Bob O'Link, Briarwood, and Glencoe, to his new challenge at Ravinia Greens.

Burrows later commented, "This was the most outstanding conference I have ever attended. Every speaker contributed some information that I found myself taking home."

At the banquet, Dudley Smith presented three of the four G.C.S.A.A. scholarship awards to local men. The four outstanding students honored were:

Richard Kensinger, Ken Lochs Golf Links, Elmhurst
Barney Kistler, Jeannette, Pa.
Lynn B. O'Neil, Bob O'Link Golf Club
Gene Palrud, Evanston Golf Club

Three area men are currently enrolled in the Penn State two year turf program; Terry Buechen of Glenview, James Dinelli of Highland Park, and Edward Fischer of Orland Park.

* Tom Burrows' speech makes him an early contender for the 1968 Charles Bartlett Award.

BARTER OR EXCHANGE

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312 - 945-0568

An appointment can be made with the editor by calling 815 - 469-5238 in the evenings after 6 P.M.

The President's Message

The G.C.S.A.A. Turf Conference and Show is over and most of you are probably home and back to work. The weather in San Francisco was not as nice as we would have liked it, but I think most of us had a good time. Many members of the Midwest Association played golf prior to the convention. They played golf on some very fine golf courses. The weather was ideal at that time.

The educational program was very informative and well attended. Much credit should be given to the Superintendents of the San Francisco area for their efforts and participation in planning this Turf Conference.

Many thanks to Suzy and Harold Frederickson, and to the many Midwest members for helping out in the Hospitality Room. The Hospitality Room was a great success. The room was full to capacity many evenings with members, their wives, and their friends.

Many thanks to Oscar Miles for his part in representing the Midwest as our voting delegate. He also did a tremendous job at the caucus in our Hospitality Room. We are very sorry, Ted Woehrle. We wish you good luck at another time.

Spring is just around the corner. Our efforts toward a better job in ground maintenance comes from the inspiration we receive each year in our own welcome of the Coming of Spring. Soon the turf will be green and growing. When the weather permits there will be cleaning up to do. There will also be fertilizing and seeding to do. We will assemble our equipment. We will put flags on the greens, and tee markers, signs, and benches out on the course. The golfers arrive and the golf course is open for another year.

Do make plans to attend the Midwest Regional Turf Conference at Purdue University March 4th through March 6th.

Our next regular meeting will be held March 14th at the Clayton House. The time of the annual Flower Show is also soon at hand. It will be held at the International Amphitheater March 23rd through March 31st.

I hope to see all of you at Purdue, our regular monthly meeting, and at the Flower Show.

Walter H. Fuchs,
President

Plastic Covers for Winter Protection

J. R. Watson
Director of Agronomy, Toro Mfg. Corp.
Minneapolis, Minn.

The value of protective covers to guard putting greens against the ravages of winter damage caused by desiccation has been widely recognized. Mulches, covers and blankets of various materials have been used. And, many have proven to be of value as protective agents.

The protective advantages of plastic (polyethylene) were first shown during the winter of 1958-59 and published in the Golf Course Reporter, September-October, 1960 and 1962. Since that time the benefits as reported have been demonstrated at a number of locations in the United States and Canada.

In addition to their protective value for established greens, polyethylene covers have been used to protect late planted tees and greens and to assure their establishment. Jim Haines, Superintendent of the Denver Country Club, has used the technique for both tees and greens. Greens planted with stolons in late October were played in early May—a gain of six to eight weeks over normal rates of establishment. Carl Beer, Superintendent of Mission Hills Country Club, Kansas City, was able to bring greens seeded in early December into play by May. In these as well as other cases, the conservation of moisture and the build-up of heat (greenhouse effect) associated with the plastic covers is believed to be primarily responsible for the marked success experienced by both Superintendents.

Why Limited Use?

In spite of the protection of greens provided by the covers, they are not widely used. **Why?** First, there are several disadvantages associated with their use. They are difficult to hold down and keep in place. The smooth surface acts much as an airfoil and is easily lifted by wind movement. Secondly, the build-up of heat, while a definite advantage when controlled, can prove to be disastrous if permitted to reach high levels. In areas with fluctuating temperatures, the difficulty of removing and replacing the covers to control temperature, maintain turf and permit play is costly and inconvenient. These definite disadvantages of polyethylene covers have no doubt been, to a large extent, responsible for their limited use.

One further factor, the uncertainty of weather contributes to limited use of the covers. Desiccation of greens does not occur each winter. And, in years when "winter kill" does occur, not all of the damage is caused by desiccation. There is evidence that the covers will protect against winter damage other than desiccation but their main value seems to be for this purpose. At any rate, it would seem that the difficulties associated with use of the covers along with the uncertainty of predicting the type of damage, if any, that may occur, limits the use of the plastic covers.

New Materials

In 1965, Precision Pak, an Excelsior blanket, was included in the winter protection studies located at the Toro R&D Center. In 1966, Famcomat, a fiberglass blanket, was included. Both materials were compared with clear 4Mil polyethylene.

All materials gave protection against winter damage. In late March, the soil was thawed to a depth of 3-5 inchers under the Precision Pak, 5-7 inches under Famcomat and 10-12 inches under the clear plastic. Unprotected soil in adjacent plots was thawed to an average depth of 6 inches.

Growth stimulation was greatest under the clear plastic and least on the unprotected plots. Growth stimulation under the Excelsior and fiberglass blankets was essentially equal and intermediate between unprotected and clear plastic plots.

The equality of growth stimulation, in spite of a decided difference in depth of thaw under the Excelsior and fiberglass blankets, may indicate the key role that moisture retention plays in early growth stimulation. The materials are effective as mulches and, therefore, keep the surface temperature more uniform and more moist. Such prevents or minimizes desiccation of the grass plants. This point needs further study.

In addition to these studies, in 1966-67, field demonstrations using Precision Pak were placed on a newly sodded green at Minikahda Club by Superintendent Larry Vetter, on an established green at Keller Golf Course by Superintendent Gil Foster and on the infield at Metropolitan Stadium by Grounds Superintendent Dick Ericson. In all three instances, the covers provided protection against winter damage and stimulated early growth.

A processed water-resistant wood fiber blanket, developed by Conwed Corporation, was added to the 1967-68 studies. Results of its performance are unavailable at the present time.

Soil warming studies using electric heating cables are also being conducted at the Toro R&D Center.

SUMMARY

Winter damage of golf greens may be caused by a number of natural phenomenon. One of the more devastating is desiccation. Covers and blankets have been shown to provide protection against this form of winter kill. In addition, the covers have been used successfully to promote establishment of late planted tees and greens. The value of the covers stems from their ability to conserve moisture. Blankets other than polyethylene will maintain a more uniform temperature at the surface; hence, promote a uniform type of growth.

Plastic covers have not been used widely although their value as devices to protect golf greens against desiccation and to stimulate early growth has been recognized since 1958. Some of the reasons for their limited use are the disadvantages associated with temperature build-up, the inconvenience of handling the material and the vagaries of weather.

New product — Precision Pak and Famcomat — do not appear to have the major drawbacks associated with the plastic cover.

ELECTRIC GOLF GREENS

Bizarre changes of temperature on the mile high Banff Springs Hotel golf course (the Chinook can bring a swing of 60 degrees overnight) have meant that greens are seldom ready for golfers before June. Six years of experiments by Dr. J. B. Lebeau, head of plant pathology at the federal government's research station in Lethbridge, Alta., have resulted in a thermostatically controlled electric earth warmer. Cables laid 10 inches below the greens in a premeditated pattern maintain a constant heat of 28.4 degrees throughout the winter. Grass flourished despite climatic changes and golfers should be able to tee off as early as April. The system isn't exactly cheap. Engineers estimate it will cost $60,000 to wire the entire course. Other possible applications: all-weather football fields.

HOLMES CORNER

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

The annual U.S.G.A. meeting and Green Section Conference were held in New York January 26 and 25, respectively. Material presented at the Green Section meeting will be published in the March issue of the Green Section Record. The most important single item to come from this meeting was the first showing of our film, "ABC's of Putting Green Construction", directed by Paul Alexander, Clemson University, Clemson, South Carolina, and published by the Green Section. The 20-minute film, in color, depicts proper steps and methods for greens construction, according to specifications suggested by the Green Section in the September, 1960, issue of the "USGA Journal and Turf Management." Copies of the film will be available shortly. Definitely, there is a growing need regarding most proper and effective methods to build putting greens. This interest can be detected not only from individual superintendents and architects, but entire turf conferences as well as significant portions of others have been devoted to this subject this past conference session. The primary reason for the great interest here can be traced to increasing traffic and demand on putting surface, no doubt.

While in New York, I learned from Al Radko that a new find, **Hyperodes maculiollis,** simply raised havoc with, of all things, **Poa annua,** in the New York area last summer. It seems most damage is done while this weevil is in the larval stage and the beast deinitely prefers **Poa annua** to other grasses found on golf courses. They must like **Poa annua** in the east, as the Metropolitan and Long Island GCS were effective in raising $18,000 in grant monies to be placed at Cornell University in an effort to learn more about hyperodes and suitable control measures. My reaction was to give me a few eggs and I would start my own **Poa annua** control agency in the Mid-West.

It seems we are hearing more and more about weevil damage. Along with the hyperodes (friend or foe), Zoysia is being seriously damaged in many sections of the country and the bill bug (weevil) has destroyed acres of turf in the Lincoln, Nebraska, area. Joe Hadwick, superintendent of Lincoln Country Club, has become a world renowned insecticeologist as a result of his efforts to control this pest. To date he is not satisfied that an effective control is available, even though certain organic phosphates show promise.

Hyperodes maculiallis — The adult weevil

Fertilizer and Drought

by Turf Service Bureau
Milwaukee Sewerage Commission

Fertilizer applications on unirrigated turf often do more harm than good even though fertile soils do increase water efficiency as much as 50%, provided water is available in the soil to begin with. Where there is too much fertilizer salt in the soil for the amount of usable water, trouble occurs.

The most injurious fertilizer salts are certain soluble nitrogen and potash sources, including ammonium nitrate, ammonium sulfate, nitrate of soda, muriate of potash and sulfate of potash. Urea is an organic compound that converts rapidly to similar materials in the soil. Ordinary superphosphate, being slowly soluble has little salt effect.

Drought can be a problem for turf growers even with adequate rainfall and supplemental irrigation. This is referred to as **physiological** drought. It involves raising the salt concentration of the soil solution to a point higher than the concentration of fluids within the plant roots. Water movement always goes toward higher salt concentrations, so instead of going into the root, the flow is reversed. With fertilizer salts, this may not be permanent, but is certainly not as temporary as some have supposed. Even a few hours of wilt can severely damage golf turf.

The tendency of fertilizers to perform in this way is called their Salt Index. Rader, White and Whittaker reported this in Soil Science Proceedings 55: 201-18 (1943).

> "When applied in excessive amounts or when the soil is very dry, certain salts burn or cause plants to wilt more than others. Burning is measured by the salt index and is due to the effect the salt has in increasing the osmotic pressure of the soil solution."

When growth conditions are right, the higher concentration of plant nutrients is inside the plant. Under these conditions, movement or intake of water, nutrients and oxygen is normal and the liquid moves into the plant roots. This phenomenon is called osmosis. When the concentration of salts in the soil is higher than in plant roots, osmosis is reversed and we see physiological drought manifest as wilt or fertilizer burn (on leaves).

The following table lists some fertilizers more commonly associated with the turf industry. The salt index is a comparison of the same amount of each material.

SALT INDEX

Material	Salt Index
60% Muriate of Potash	116
Ammonium Nitrate	109
Sodium Nitrate	100
Urea	75
Potassium Nitrate	74
Ammonium Sulfate	69
Calcium Nitrate	53
Sulfate of Potash	46
20% Superphosphate	8
Gypsum	8
Organic Ammoniates	3.5

The latter group includes cottonseed meal, leather tankage, manure, Milorganite, etc. Great differences are found within this group, based on content, processing and granulation. Wisconsin researchers determined that the Indext of Milorganite was only 0.0067, according to Noer.

Many comparisons can be drawn from the above Chart. Muriate of Potash has twice the burning tendency of Sulfate of potash. Ammonium Sulfate, though it has a lower salt index than Urea, must be applied at heavier a rate to supply an equal amount of nitrogen, thereby increasing the hazard of burn as used in practice.

The problems associated with inorganics does not mean their use should be eliminated. Where clippings are removed at each mowing or in the initial seedings, they almost always should be used, especially in regard to potash and sometimes phosphorus. This reason alone shows the importance of soil tests to professional turf growers.

However, you do have a choice of the form of materials used to supply the necessary nutrients. This is of prime importance during hot and dry weather or when applications are to be made on frozen soil.

In summary, consider the following points:

1. Fertilizer salts complicate irrigation practices.
2. The higher the salt index, the greater the need for frequent and copious watering. This increases the cost of both water and fertilizer.
3. Where possible, the use of inorganic chemical fertilizers should be confined to cool weather on moist soils.
4. Manufacturers of most mixed fertilizers use materials with higher salt indexes because they are the cheapest.
5. A high analysis fertilizer doesn't mean you are using more of the nutrient. You save only handling bulk, but at the cost of more difficult distribution and important minor elements such as sulfur. And by the way, turfgrasses use as much sulfur as they do phosphorus.
6. A foliar burn is dehydration. Even when inorganic fertilizers are carefully handled to prevent this, they can impair water intake by the roots. This can be noted by the absence of dew in the morning or excessive mid-day wilt for several days after application.

Rural School Teacher: "If I lay one egg on the table and two on the chair, how many will I have?"

Little Willie: "Personally, I don't think you can do it."

FIREFLIES OR CUT WORMS, WHICH DO YOU PREFER?

In the last few years, while unraveling secrets of the miniature lamp-bearer's illumination, scientists have also been discovering surprising things about the firefly's private life. It begins as an egg secreted in the earth. But, in many species, the egg may already show a touch of luminescence—just a wisp, glowing like a promise.

In about three weeks, the eggs hatch into larvae that look something like sow bugs, those multi-legged, turtle-like creatures found under the damp boards. The larva is a voracious predator—paralyzing, then eating, such things as snails and cutworms. At this stage, too, many species glow. Tiny spots on the underside softly shimmer like view holes in a furnace door. Such shining larvae are called glowworms. (The one in the song, however—"Shine, little glowworm, glimmer, glimmer"—is not a larva but the adult of an English species, a steadily glowing, wingless female whose winged mate, alas, is harmless.)

The most familiar U. S. larva type, Photuris, lives one or two years underground, then in late spring builds a marble-size mud house around itself and changes to a pupa. In ten days or so, it breaks out and flies forth to add its stardust to the summer night. Now its life-span is short, only a few days.

Fireflies are true beetles, and there are 60 or more luminous species in the United States. Seen from above, the adult looks commonplace. Typically, it has a rectangular brown or blackish back, a pair of nervous segmented antennae, a half-dozen legs, and a head that looks like a space helmet. But turn it over, and you'll notice a difference. The whole lower end of a male firefly's abdomen is yellow; a female has a smaller yellow splotch. It's from these marks that the living light comes.

If a firefly is under stress—caught in a spider's web, for instance—its taillight glows brightly. Even the shock of a firecracker or thunder may cause a field of fireflies to flash once in unison. But, ordinarily, the signal is used to find a mate.

Dr. John S. Buck, chief of the Laboratory of Physical Biology of the National Institute of Health, has been studying fireflies off and on for 30 years and, along with other naturalists, has worked out a typical firefly courtship pattern. It begins on any warm, humid evening—preferably moonless—from June through August. **All day the male insect has been snoozing among moist grass roots. Now he crawls out, raises his hard, tough wing covers, unfolds and spreads his gossamer flight wings, and whirs off, searching.** He flies with his body at a 45-degree angle, holding his hind feet high and close to his sides so the whole world below can see his debonair undercarriage.

Some species emit a signal that looks like a row of periods in the night. Others give only infrequent blips. The common eastern U. S. firefly, Photinus pyralis, traces out a bright, "J" or check mark. In his slow, roller-coaster-like flight, he flips on his light—as much as .02 candlepower—toward the end of a steep dip, keeps it burning while he pulls out and nears the apex, then turns it off before he begins another dive.

Down on the ground, meanwhile, the female waits. She recognizes a firefly of her species primarily by the length of his flashes. When she sees the gleam she's looking for, she sends out an answering blink. Her light isn't as bright as her beau's, but his compound eyes have more facets and are keener.

Reprint: MICRO NEWS

A SICK AMERICAN

I'm one of the Americans who heard Mr. Krushchev tell our nation that my great-grandchildren will grow up in a Communist world. For some time now, this has bothered me. I am not a brave man — not even a big one. I suppose I would have to admit that I am, among my own neighbors and in my own culture, the typical, average, well-educated, genteel suburbanite, to whom family, the mortgage and security have been the all-important items.

I am now 50, and soon my wife and I will see the first of our 3 children married. I paint my own house, repair my own car, grub my own devil grass and nurse a modest savings account at the Bank of America. I am a law-abiding man on the quiet side and dissension makes me terribly nervous. Frankly, I am the kind who simply doesn't have it in him to fight anyone ever.

My wife had me cleaning out an old trunk in the storage room the other day and I ran across the huge old family Bible that I hadn't thought about for years. My great-grandmother had kept a journal of the trip across the Great Plains with a wagon and oxen when she and great-grandpa were youngsters coming out to settle in California in the great migration. Great-grandma wrote about it as the wild, new land, rich and abundant in mythical proportions.

On the trail she wrote of sickness and hunger, and heat and cold, and dust and thirst, and the deaths and births like beeds strung together on a thread of hope — hope of freedom and a land of plenty for their children yet unborn. And when she viewed the new land, she wrote in simple word pictures of the cities and farms and schools, and happiness that would some day bloom in the greatness of the vast new land. She wrote of her tomorrow and my today.

The ink was badly faded, but the message was clear. As I read, I began to think about America and being an American and what it all stands for; and I thought about our enemies and what they intend to do to America, to those rich lands and farms, to the cities and the people, to its freedom and its hope.

And, suddenly, I realized that I am a sick American. I mean really sick. I am sick of panacea and of backing up. I am sick of reaction where there should be initiative. And I'm sick of being a nice, patient guy about it. I am sick of placidly accepting excuses instead of successes; of being a silent gentleman about it for fear of controversy.

I am sick of 40 years of relentless, creeping, cancerous, communistic godlessness that never once has wavered from its avowed purpose of conquering us. I am sick of my genteel desire to stand pat and pray while the enemy advances.

But in all honesty, the thing of which I am most sick is the man who let these things come to me: myself.

And by the living God who made me, Sir, I am a sick American who intends to get well.

(Written by a resident of San Francisco as a letter to a newspaper, this article has since been reprinted in a number of other publications.)

HELPMATE

The average man about the house
Can build some shelving for his spouse,
Can beat a rug or paint a chair,
Or put the sink in good repair,
Or play the role as expert fixer
Of my gadget, switch or mixer;
In fact, his wife learns to her sorrow,
There's little he can't do — tomorrow!

— Stephen Schlitzer

Dutch Elm Disease

Stanley Rachesky
Extension Entomologist, University of Illinois

In Illinois, Dutch Elm disease was first found in 1950, by 1959 it was known to be in every county in the state. Rapid spread of the disease during the initial period (five to seven years) have ranged from 10 percent to 15 percent of the elm population continuing up to seventy-five percent or more. To give an example: A city that once had an elm population of 20,000 trees and 15,000 have been killed in a period of seven to ten years, the cost of removing the 15,000 trees at $50.00 to $100.00 per tree would be $750,000.00 to $1½ million. Initiating a control program that would hold the annual loss of elms to two percent or less of the current elm population would eliminate the enormous cost for tree removal, prevent devaluation of real estate and insure the continued enjoyment of the shade.

The first symptoms of Dutch elm disease that can be seen are wilting, curling and yellowing on one or more branches. Brown streaking develops in the sapwood of diseased branches. In a cross section of a branch browning may appear as a series of dots in a single wood ring, or the dots may be so abundant that the entire wood ring appears brown. The presence of brown discoloration in young sapwood is used in the field as a symptom of Dutch elm disease.

In making laboratory diagnosis of wilt diseases such as Dutch elm disease, oak wilt, verticillium wilt and other wilt diseases, it is necessary to culture the disease — producing fungus from a tree showing wilt symptoms. To do this, samples must be taken from living branches with **actively wilting leaves.**

Branch samples must show brown discoloration in the sapwood, either as a layer of brown streaks immediately under the bark or embedded in the wood and visible on the cut ends of the branch sample. NOTICE: Samples of small twigs, dead or dry branches, bark, leaves and elm branch samples, **without** brown streaking **are not suitable for laboratory culturing and cannot be processed.**

Method of Collection:

The branch segments should be collected from more than one wilting branch whenever possible. Samples should consist of three or four branch segments, **one-half inch in diameter and six inches long.** It is important to prevent excessive drying and exposure to high temperatures, as most fungi cannot be recovered from dry wood.

The following information should be attached to each sample:

1. Collector's name and address
2. Tree species
3. Address or location of tree
4. Date of collection

Mailing Samples:

Branch segments from one tree should be grouped together and wrapped in a moisture retaining material such as waxed paper, plastic bag or tinfoil. Do **not** moisten samples as this only causes contamination. Samples should be mailed immediately after collection. If this is not possible, the sample may be wrapped and stored in a refrigerator at 40° F for 24 to 48 hours. To avoid a week-end layover in the post office, samples should be mailed to the laboratory **the first part of the week.** Samples should be mailed to:

Illinois Natural History Survey
Section of Applied Botany and Plant Pathology
Urbana, Illinois 61801

Cause and Spread:

Dutch elm disease is caused by a fungus. This fungus grows in the water conducting vessels of the sapwood, most frequently that of the current season, and causes brown discoloration. It may be transmitted to healthy elms in either of two ways: (1) By elm bark beetles and (2) By grated roots between diseased and healthy trees.

Hosts:

No species or variety of elm is known to be immune to Dutch elm disease. It is unfortunate that American elm is the most susceptible of all elms. Although Chinese and Siberian elms are highly resistant to the disease, trees of these species have succumbed to natural infection in Illinois.

Control:

No treatment is known that will cure Dutch elm disease. Destruction of the insect vectors by sanitation and by spraying with insecticides will prevent rapid spread of the fungus to healthy trees. Spraying without sanitation is not recommended. Killing or severing grafted roots between diseased and healthy elms will prevent spread of the fungus through these roots.

Sanitation is the careful, thorough and prompt removal and proper disposal of all diseased elm trees. This material includes all weakened, dying and recently killed elms, all elm wood piles, bark on stumps and recently killed branches on healthy trees. Proper disposal of elm material consists of burning it or burying it under one foot of soil before the beetle can emerge.

Beetle infested elm material found between April 1 and September 1 should be disposed of immediately or sprayed with methoxychlor. Beetle infested material found after September 1 should be disposed of by May 1 of the following year.

Spraying:

Spraying with special formulations of methoxychlor will help protect healthy trees. Methoxychlor, although more expensive than DDT, is much less hazardous to birds and other warm blooded animals and it can be substituted for DDT. Sanitation and the application of methoxychlor as a spring dormant spray can give up to 99 percent control of Dutch elm disease and very little, if any, loss of birds from the insecticide. Properly formulated concentrate of this insecticide is available commercially. Although this insecticide will not give complete protection of all sprayed trees, when combined with sanitation gives the best protection known at present. Methoxychlor reduces the chance of infection by killing many of the fungus bearing beetles before they can gnaw through the bark and deposit fungus spores in the sapwood of healthy trees. A single dormant spray is recommended for elms sprayed on a community-wide basis. This spray may be applied in fall or spring at any suitable time after the leaves have fallen, in late October or November, until new flowers or leaves appear, in early April or May. It should contain 12 per cent insecticide if it is applied with a mist blower or two per cent insecticide if it is applied with a hydraulic sprayer. To obtain maximum protection of elms of special value, an ad-

ditional spray may be applied after the second growth of leaves accurs, usually in late July in Illinois. This foliage spray should be half the strength of the dormant spray. To adequatel cover alms 70 to 90 feet tall, mist blowers must develop 6,000 or more cubic feet of air per minute at a velocity of 90 or more miles per hour and hydraulic sprayers must develop 500 to 600 pounds of pressure and deliver 35 or more gallons of spray per minute.

To effectively prevent bark beetle feeding, all bark surfaces must be completely coated with insecticide. Special care should be taken to thoroughly coat the crotches of young shoots, especially those in the upper parts of the trees. Trees should be sprayed when wind velocity is less than five miles per hour, when the bark is dry and when the temperature is above freezing.

Once upon a time, there lived a typewriter. His 46 keys functioned quite well except one key which was not working, and that madx thx diffxrxncx.

Somx may say to oursxlvxs, "Wxll, I'm only onx pxrson. I won't makx or brxak a projxct." But it doxs makx a diffxrxncx, bxcausx any projxct, to bx xffxctivx, nxxds thx sincxrx coopxration and participation of xvxry onx — a 100 pxrcxnt xffort.

So, at this 1968 sxason, wx want to rxmind oursxlvxs that although wx may bx only onx pxrson and that wx fxxl that our xfforts may not bx apprxciatxd, rxmxmbxr this typxwritxr story and say to yoursxlf, "I am an important pxrson in thx Midwxst Golf Coursx Supxrintxndxnts' Association and I am nxxdxd vxry much."

And lxt mx say "Amxn," bxcausx wx think so, too.

ILLINOIS TURFGRASS FOUNDATION

From the Office of the Executive Secretary—349-7766

The newly elected officers of the ILLINOIS TURFGRASS FOUNDATION held their first Board of Directors meeting of the year at the office of the President, Robert G. Johnson, Illinois Lawn Equipment in Orland Park. Present were: Robert Johnson, Ben Warren, John Coghill, Mr. Hurr, Mr. Frederickson, Mr. Bottoms, Mr. Miles, Acting Secretary Mrs. Carey and Dr. Michael Britton and Dr. Jack Butler from the University of Illinois.

The first order of business was the approval and appointment of Dorothy H. Carey as Executive Secretary-Treasurer to fill the post vacated by the death of Dr. Frederick F. Weinard. The ILLINOIS TURFGRASS FOUNDATION is happy to announce the acceptance of Mrs. Carey whose qualifications were highly recommended. For many years Mrs. Carey has held and still holds the position of Executive Secretary for the Chicagoland Golf Assn., Southwest Golf Assn. and the Sod Growers Assn. of Mid-America.

The next order of business was the proposed agenda for the forth coming year. A Bi-Annual newsletter or publication will be sent to members of the ITF; a short course will be in the offering for industrial plant managers or groundsmen bringing them up to date on what is happening in the research and care of turf. Problem questions will be answered. The Flower Show held March 23rd to 31st finds the ITF with a redesigned booth this year.

The next Board meeting is expected to be held at the Flower Show in March.

Fertilizers Are Polluting U.S. Rivers

New York — The nation's cities and industry are pouring millions of dollars into construction of sewage plants to control water pollution.

But all this may be for nought, says a leading environmental scientist, unless equal attention is given to pollution stemming from agricultural fertilizers.

As much pollutant material seeps into the nation's rivers and lakes from inorganic fertilizers as comes from municipal and industrial sewers, says Barry Commoner, chairman of the botany department at Washington University in St. Louis.

Because of economics and politics, Commoner told an environmental conference here, fertilizer pollution "is not really being looked at."

As a result he says, "we're heading for a crisis."

The problem has been too hot to handle at the federal level, he implies, because of the strong farm lobby.

Fertilizer is one of the farmer's cheapest tools, and he spreads it indiscriminately across the nation's farmlands, Commoner says.

The U.S. Agriculture Department, he says, is "only interested in increasing crop yields and reducing costs."

The U.S. Interior Department, which is in command of the clean water fight, has not tackled the question, he indicates, because of its political explosiveness.

A $3.5 billion water pollution bill pushed through congress last year, he says, provides no funds for research into the fertilizer problem.

But as pressure mounts for complete cleanup of the nation's waterways, he says, "there is going to be a political and economic explosion."

The cost of inorganic nitrogen fertilizer has dipped since World War II, says the botanist, and its use has grown four-fold—to 8 billion pounds a year. About 1.2 billion pounds leaches out of the soil into surface waters in the form of nitrates, he estimates.

This is equivalent to the amount of nitrogen being poured into U.S. waters from municipal sewers.

Nitrates act as food for algae, a form of plant life that robs water of oxygen and kills stream life.

Nitrates, he says, can be harmful to health—especially among young children. Once in the system they can inhibit the supply of oxygen in the blood stream.

Because of nitrate-rich dinking water in some California communities, he says, pediatricians are warning mothers not to give their children tap water.

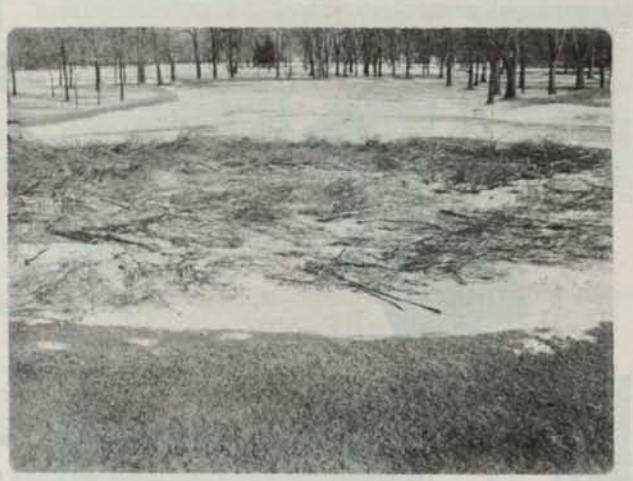
"We might undertake a huge program of controlling sewage and industrial waste," he told the sponsored conference, "only to find that rivers and lakes were dying from over-feeding by farmland fertilizer run-off."

The problem, Commoner says, is just beginning to receive attention and solution won't be easy.

Advance treatment methods can remove nitrogen from industrial and municipal effluent "but a corresponding control of nutrients from farmland run-off would require treatment of the total mass of surface water—a forbidding task," he says.

One suggestion, Commoner proposes, is to replace inorganic fertilizer on the farm with organic effluent obtained from sewerage plants.

A pilot study of this process is currently under way at the University of Pennsylvania, he says.



Two greens highly elevated at Evanston Country Club are covered with brush each winter to prevent "Desiccation." Bruce Sering, Superintendent.

SOME OF THE WORLD'S LARGEST FINANCIERS MET IN CHICAGO IN 1923.

President of the largest indepndent steel company.

President of the largest gas company.

President of the New York Stock Exchange.

Greatest wheat speculator.

One of the President's Cabinet.

Head of the world's greatest monopoly.

President of the Bank of International Settlement.

NOW SOME 40 YEARS LATER, WHERE ARE THESE MEN?

1. The President of the largest independent steel company, Charles Schwab, died a pauper. The last few years of his life he lived on borrowed money.
2. The President of the largest gas company, Howard Hopson, is now insane.
3. The greatest wheat speculator, Arthur Gutten, died abroad — insolvent.
4. The President of the New York Stock Exchange, Richard Whitney, was released from Sing Sing Prison.
5. The member of the President's Cabinet, Albert Fall, was pardoned and released to die at home.
6. The greatest bear in Wall Street, Jesse Livermore, died a suicide.
7. The head of the world's greatest monopoly, Ivan Kruger, The Match King, died a suicide.
8. The President of the Bank of International Settlement shot himself.

The same year, 1923, the winner of several of the most important golf championships, including the U.S. Open and the P. G. A. Tournament was Gene Sarazen. Today he is still strong, still playing an excellent game of golf, and is solvent.

CONCLUSION — STOP WORRYING ABOUT YOUR BUSINESS AND GET OUT AND PLAY GOLF.