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

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PRESIDENT'S MESSAGE

By the time you read this, the 55th annual GCSAA Conference and show in Las Vegas will be over. When everyone arrives back home we will be asking ourselves what we gained by attending the Show. If you didn't feel you gained much, it won't be because the opportunity wasn't there. I honestly can't say that I have ever been so disappointed with a GCSAA conference that I didn't want to attend the following year. Is there anything that has as much to offer in one place all at the same time?

We also have a new Board of Directors at GCSAA. On behalf of the MAGCS, I wish them the best of luck. All GCSAA members are looking to these men to provide the leadership necessary for a strong, stable, and progressive professional association. Let's hope their years of experience as Superintendents has taught them the value of communication and dedication to their peers. They are the finest of our profession and we put our trust in them with our votes.

When I think of the GCSAA, the first thing that comes to my mind is education. I give them an A + in this category. My congratulations to Jim Prusa for a job well done! Since he has come on board with GCSAA, he and his staff have improved the educational opportunities greatly by having a thoughtful ear tuned to the wishes of the average GCSAA member. Ironic that one of our own, a Golf Course Superintendent, could handle that task so well! Sometimes solutions to problems can be found right in your own backyard.

Perhaps by now I will have met John Schilling, GCSAA's new Executive Director. I have heard nothing but good reports about this man's experience, performance, and dedication. I wish him the best of luck. Just think, if Schilling and Prusa can maintain a good working atmosphere and the rest of the employees in the main office in Lawrence actually like each other, it just might ...

If the right chemistry is there, the sky is the limit for GCSAA and it's members. We all hope it is the right chemistry, and the reaction takes place in the coming year.

Roger Stewart, CGCS

MAGCS Directors Column Assignments

March	Mike Hart	August	Dave Behrman
April	Phil Taylor	September	Joe Williamson
May	Jim Evans	October	Dave Meyer
June	Julius Albaugh	November	Jim Evans
July	Sean Daley		

DR. WILLIAM H. DANIEL NAMED RECIPIENT OF THE 1984 USGA GREEN SECTION AWARD

FAR HILLS, N.J. — Dr. William H. Daniel, Professor of Agronomy at Purdue University, has been selected as the recipient of the 1984 Green Section Award, presented by the United States Golf Association in recognition of distinguished service to golf through work with turfgrass.

Dr. Daniel will receive the award on Feb. 2, 1984, at the Golf Course Superintendents Association of American Annual Banquet and Show at the MGM Grand Hotel in Las Vegas. The presentation will be made by George M. Bard, Chairman of the USGA Green Section Award Committee.

The theme of the Green Section Conference will be "The Business of Golf Course Management." For the fourth consecutive year, the conference will be held as part of the GCSAA International Turfgrass Conference and Show.

The USGA established the Green Section Award in 1961 to honor those persons meriting special recognition for their distinguished service to golf in any phase of work with turfgrass, i.e., research, education, extension, superintendence, maintenance, management, etc.

In presenting the Green Section Award, the USGA wishes to identify, celebrate and hold up for emulation individuals, such as Dr. Daniel, who exemplify outstanding dedication to golf through their work with turfgrass.

Born in Sparkman, Ark., Dr. Daniel earned a bachelor of arts degree in social science from Ouchita College in 1941. In 1947 he was awarded a bachelor of science degree in agriculture from the University of Arkansas. Then he enrolled in Michigan State University where he received his master of science degree in 1948 and his doctoral degree in soil science in 1950.

Dr. Daniel began his career in turf management in 1950 as an assistant professor at Purdue University. In 1954 he was promoted to associate professor and in 1957 to professor.

Throughout his distinguished career, Dr. Daniel has enjoyed a reputation as a dedicated researcher and educator. His long-term research projects have included the development of improved strains of grasses for the turf industry, the use of sands for golf greens construction and maintenance, moisture sensing to aid the golf course turf manager, and the uses of the slow-release forms of nitrogen. In addition, he has been active in the evaluation of plant growth regulators, herbicides and fungicides for turf professionals.

In particular, Dr. Daniel has been responsible for the development or improvement of agronomic programs, practices and products in the following areas: a) development of pre-emergent crabgrass controls and their application, b) use of calcium arsonate for the control of **Poa annua**, c) use of electric soil warming to maintain turf growth and survival, d) use of vertical turf thinners, vertical turf seeders and vegatative turf planters, e) introduction of soil conditions for porous rootzones, f) introduction of Sodco bluegrass, Evansville bentgrass and Midwest zoysiagrass, g) introduction of plastic field covers to reduce heat buildup on covered turf such as athletic fields, and h) invention of the Prescription Athletic Turf System (PAT) for use on football and baseball fields.

In 1978, Dr. Daniel received a grant from the United States Department of Agriculture Pesticide Assessment Program to determine potential applicator exposure to site users. He is investigating pesticides currently under registration restriction by the Environmental Protection Agency.

He also is a member of the committee established by the USDA Science and Education Administration to evaluate arsenic relative to the EPA's concern about its effects as an environmental hazard.

Dr. Daniel has served on the executive committee of the International Turfgrass Society and is a member of the board of directors of the Musser International Turfgrass Foundation. He has served on the USGA Green Section Committee since 1954.

As an educator, Dr. Daniel has taught agronomy courses and supervised graduate student programs at Purdue and has assisted more than 200 students seeking employment in the turf management field.

As an extension worker, he has served as the long-time executive secretary of the Midwest Regional Turf Foundation, coordinator of the annual Midwest Regional Turf Conference and editor of the conference proceedings and author of **Turf Management Handbook** and of many extension leaflets on lawn care.

Dr. Daniel averages 40 out-of-state trips each year as a guest lecturer on a wide variety of turfgrass subjects. These extensive speaking engagements are indicative of his philosophy of rapid sharing of new ideas and information about improvements in turfgrass.

His peers honored him as a Fellow in the American Society of Agronomy in 1964 and as the Agronomic Service Award recipient in 1973. In 1975 the GCSAA bestowed upon him its Distinguished Service Award.

1961 John Monteith, Jr.	1972 Herb and Joe Graffis
1962 Lawrence S. Dickinson	1973 Marvin H. Ferguson
1963 O. J. Noer	1974 Howard B. Sprague
1964 Joseph Valentine	1975 Fanny-Fern Davis
1965 Glenn W. Burton	1976 James R. Watson
1966 H. Burton Musser	1977 Edward J. Casey
1967 Elmer J. Michael	1978 Jesse De France
1968 James L. Haines	1979 Arthur A. Snyder
1969 Fred V. Grau	1980 C. Reed Funk
1970 Eberhard R. Steininger	1981 Joseph M. Duich
1971 Tom Mascaro	1981 Charles G. Wilson
	1982 Alexander M. Radko

DIRECTOR'S COLUMN

LIFE AND TIMES IN THE FOX VALLEY

There is something to be said about fancy country clubs and working for an exclusive golf course as the superintendent. I suppose that everyone has a deep-down yearning for the top job in the district. After all, we all have an ego. But, no matter where we work, we probably find several reasons for wanting to stay and do the best job possible. Whether it is community location, membership co-operation, privileges at the course, or the type of golf course; it makes all the difference in the world about any decision that has to be made about changing job location. Moving is a tough decision to make because it not only affects future job security, but it involves the happiness of the entire family and the adjustment to a big move.

Every year I get the bug to move to another golf course, yet it has nothing to do with the above-mentioned reasons for staying. This feeling is like clockwork every year. And I think after nine seasons at my club, we have finally figured it out. First of all, there is the sudden letdown at the end of the season when I'm not as busy every day. It is difficult to adjust to a new pace, one with some free time and peace of mind. Then there is the frustrating situation of having to fight for a new budget. I certainly feel justified in asking for more money for the club operation when I have had to wrestle with a golf season. Arbitrary budget cuts from the board of directors really bug me. It's a good thing we are least permitted to defend expenditures and hopefully get some or all of it back. I am sure other people share the same worry at the end of the season, when the new board becomes active. It is no fun having to re-educate a new green chairman after you have just gotten used to the last one. Thank God for vacations and a chance to take those "10 deep breaths".

Between the holidays, a little vacation, and a trip to the annual GCSAA Conference, most of us get our motivation back. And by the end of the winter season, we are all chomping at the bit to get those greens cut and traps reworked. It's not such a bad life out there in the valley, taking care of my little country golf course after all. Tell me, do you guys at the fancy clubs get these kinds of feelings once in a while too?

Peter Leuzinger, CGCS

GOOD OLD DAYS ARE NOW

The Reverend Richard Stephens, Vicar of a church in Cheshire, England: "Our forefathers did without sugar until the 13th century, without coal fires until the 14th, without buttered bread until the 16th, without tea or soup until the 17th, without gas, matches or electricity until the 19th, without cards, canned or frozen foods until the 20th. Now what was it you were complaining about?"

To accuse others for your own misfortune is a sign of lack of education; to accuse yourself shows that your education has begun; to accuse neither others nor yourself shows that your education is complete.

Epictetus

Credit: The Georgia News 12/83

CONSIDERATIONS FOR SEWAGE SLUDGE USE ON LARGE TURFGRASS AREAS

There has been increased interest in recent years in using sewage sludge to provide plant nutrients and/or organic matter for crop production, for reclaiming lands and for turfgrass establishment and maintenance. Several factors contribute to this increased interest. The cost of fertilizers, the steadily increasing annual production of sewage sludges, a ban against the ocean-dumping of sludges, the high energy costs of sludge incineration and the impracticality of landfilling liquid sludges are some reasons why the direct land application of sewage sludge is becoming more common.

Milorganite, a dried and processed Milwaukee, Wisconsin sewage sludge by-product, has been used for many years as a turfgrass fertilizer. A number of other organic, slow release turfgrass fertilizers on the market are formulated in large measure from sewage sludges. Today, liquid sewage sludes (2 to 6% solids content) from Pennsylvania municipal wastewater treatment plants are being spread on a variety of turfgrass areas such as sod farms, golf courses, grassed parking lots, parks, cemeteries, and athletic fields. Is this a safe and beneficial practice? Are there any legal restrictions regarding such applications? What are some of the practical things one should consider before using these sludges as a fertilizer and/or soil conditioner? The purpose of this article is to address these questions relative to sewage sludge use on large turfgrass areas.

Since sewage sludges are a by-product of municipal wastewater (sewage) treatment plants they contain almost every conceivable element, compound or substance found in human, home, commercial and industrial wastes. Research at The Pennsylvania State University has shown that sewage sludges from plants across the Commonwealth contain appreciable but variable quantities of essential, major and minor, plant nutrients such as nitrogen, phosphorus, and potassium, calcium, magnesium, iron, manganese, boron, molybdenum, zinc and copper as well as non-essential elements like chromium, lead, nickel, mercury, cadmium and exotic organics such as polychlorinated biphenyls (PCB's) and pesticides. A number of these elements and substances can be toxic to plants at low soil levels and some, notably cadmium, represent a food chain hazard. The heavy metal elements such as zinc, copper, chromium, lead, nickel, and cadmium are held tenaciously by the soil complex and will accumulate and persist in the soil. Once in the soil they cannot be removed by current technology except by stripping and removing the contaminated soil. Hence the application of sewage sludges containing appreciable heavy metals is of concern to future as well as to present uses of that land.

To insure that sewage sludge applications to turfgrass areas are safe and beneficial one must know what the sludge contains. A complete chemical analysis including sludge content of total nitrogen, phosphorus and potassium plus the percent solids and heavy metals content is needed so that appropriate application rates may be determined. Sludge testing and interpretation service is available from the Agronomy Department at Penn State through your County Agricultural Extension Office. Table 1 shows the ranges in composition found in sewage sludges from over 100 wastewater treatment plants analyzed by this service program. Obviously, it is not possible to make accurate generalizations about sewage sludges of Pennsylvania except to conclude that they are extremely variable in composition. It is not possible to predict the fertilizer value or potentially hazardous nature (heavy metals content) of sewage sludges without a chemical analysis.

The Pennsylvania Department of Environmental Resources (DER), recognizing the potential public health implications of land applied sewage sludges, adopted new Solid Waste Management Rules and Regulations in June of 1977. These regulations require a permit by the municipality and/or hauler before sludges can be land applied. Before a permit is granted the sludge must be chemically analyzed and the proposed spreading site evaluated. If you plan to haul and spread sewage sludge onto any kind of land you need a permit. If someone else proposes to haul and spread sewage sludge onto your land that person needs a permit and your land must be evaluated for suitability as part of that persons' permit. Hence there are legal restrictions involved in the use of sewage sludge on land in Pennsylvania. For more information and guidance on obtaining a sewage sludge use permit contact your local DER office.

As an integral part of these Solid Waste Management Regulations, DER adopted Interim Guidelines which are used to determine appropriate application rates for agricultural lands based on sludge analyses. Table 2 shows the maximum heavy metal loading rates for municipal, septic tank and holding tank sludge residues listed in these Interim Guidelines. Crops grown and sludge nutrient content are also important factors considered in these guidelines but are not shown here. These guidelines are termed "Interim" because they are subject to change. As research is completed these guidelines will be revised and updated to reflect the current state of technology.

A comparison of the ranges of heavy metals found in Pennsylvania sewage sludges listed in Table 1 with the recommended heavy metal concentrations of the DER Interim Guidelines in Table 2 illustrates the reasons for concern in using sludges without chemical analyses. For example, the maximum recommended sludge concentration of cadmium is 50 ppm (Table 2) and Pennsylvania sludges have been found to contain from 2 to 3000 ppm of cadmium (Table 1). Applications of a 3000 ppm, or even 300 ppm, of cadmium containing sludges could render a soil contaminated for future cropland uses. Sludges containing concentrations of heavy metals equal to or less than the maximum listed in column 2 of Table 2 can be used at a rate not to exceed 10 dry tons per acre per year for no more than 3 years (30 total dry tons). Sludges containing concentrations of heavy metals exceeding these guideline amounts can be used but at considerably lower yearly and total application rates. It is further recommended that sludged soils be sampled and analyzed for heavy metal buildup after 3 years of sludge treatment in order to determine if any further application of sludge can safely be made. These special tests for soil heavy metal content are also available through your County Agricultural Extension Office.

Assuming one has access to a domestic type sludge low in heavy metals and containing appreciable plant nutrients and has the necessary land application permit, what are some other things worthy of consideration?

Public Acceptance:

There is always reluctance on the part of some people to walk on or even live near sludged-turfgrass areas. You will likely have to answer their concerns. Digested, stablized sewage sludges have an earthy type odor which is not offensive but nevertheless is noticeable, especially when first spread. This odor is not harmful. Research indicates that almost all (99%) of the bacteria, viruses and pathogenic organisms in sewage sludges are killed by the high

(con't. page 9)

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*Daconil 2787 is a registered trademark of Diamond Shamrock Corporation.

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With any chemical, follow labeling instructions and warnings carefully.

DU PONT

HOARFROST

In anticipation of the change of seasons, John Muir once wrote: "I had long lived in bright flowery summer, and I wished to see the snow and ice, the divine jewelry of winter once more ..."

For Wisconsin, winter provides a special variety of this Muir jewelry known as hoarfrost.

During long, clear, calm nights when chilly temperatures move southward the air cools to the dewpoint and is saturated with moisture. Subsequent cooling results in condensation which produces dew when the dewpoint is above freezing. But when the dewpoint is below freezing, the water vapor sublimates, or skips the liquid stage and is deposited as ice crystals on some cooling surface, be it a blade of grass, a leaf or an entire tree.

Frost tends to form initially and most copiously at edges and points because this is where the cooling rate is greatest.

Generally, there are two types of this kind of frost: columnar and tabular. The columnar (branch-like) occurs when water vapor is deposited rapidly at temperatures not much below freezing. The tabular (flower-like) on the other hand, is favored when temperatures are much below freezing and the deposition occurs relatively slowly.

The lacy, plume-like growth on window panes is another form of hoarfrost which grows indoors. With extremely cold outdoor temperatures, windows may become so cold that the indoor water vapor exposed to them is deposited on the pane. These intricate and delicate patterns usually follow scratches and abrasions on the glass. Try scratching your initials on a pane and see the unique patterns that form around them.

Credit: Wisconsin Natural Resources Jan./Feb. 1984

temperatures and pH's achieved in digesting and stablizing the sludge. The remaining viable organisms die off quickly in the hostile soil environment. Hence there is little threat to human or animal health if reasonable precautions are followed. Sludges spread onto the surface of golf fairways, parks, athletic fields or similar areas should be done in off-season or well in advance of periods of active use for obvious reasons.

Fertilizer Value:

An average municipal sludge contains 4% total nitrogen, 2% phosphorus and 9.5% potassium on a dry weight basis. This translates to about 80 pounds of total nitrogen, one-half which is available the year of application (40 pounds available nitrogen, 40 pounds of phosphorus and 10 pounds of potassium per dry ton of sludge. However, most sludges are liquid and seldom contain more than 5% solids. On the average, 1 dry ton of sludge would be equivalent to 5,000 gallons of liquid sludge. To supply 4 pounds of available nitrogen per 1000 square feet with this sludge, 500 gallons per 1000 square feet (20,000 gallons per acre) would be needed. Such an application would provide 4 pounds of phosphorus per 1000 square feet but only 1 pound of potassium per 1000 square feet. The sludge application would have to be supplemented with a potash fertilizer. Such amounts of sludge are more easily applied and soil incorporated during seedbed preparation of turfgrass areas. Sewage sludge use in the establishment of turf may be more practical than maintenance type fertilizer applications. The practical and economic aspects of 20,000 gallons per acre applications depends on many questions only the user can answer. Is the sludge free or is there a charge? Will the sludge be hauled and spread by the municipality or hauler or by me? If I haul the sludge what equipment do I need? How far must I haul? Does the sludge nutrient content justify the time, labor and costs involved? Will the municipality pay me to accept it or to haul it or both? If I become a hauler of sewage sludge I will need a permit. Do I want to go to that trouble or not? These are some of the questions you may wish to ask yourself in your consideration of using sewage sludge on large turfgrass areas.

Table 1. Ranges in composition of sewage sludges from Pennsylvania municipal wastewater treatment plants

Major Plant Nutrients and Solids, %			Heavy Metals ppm, dry wt. basis	
Nitrogen	< 1	-36	Zinc	400-16,000
Phosphorus	< 1	-6	Copper	200- 6,000
Potassium	< 0.1	-4	Chromium	100-14,000
Solids	< 1	-97	Lead	100- 8,000
			Nickel	20- 1,500
			Cadmium	2- 3,000

Table 2. Maximum heavy metal loading rates for municipal, septic tank, and holding tank sludge residues

Element	Maximum Sludge Concentration, ppm dry wt. basis	Maximum Loading Rate, lbs/acre/yr	Lifetime Maximum
Zinc	2000	40	
Copper	1000	20	
Chromium	1000	20	
Lead	1000	20	
Nickel	200	4	
Cadmium	50	1	3 lbs/acre

Credit - Pennsylvania Turfgrass Council, 1978
Raymond F. Shipp, Extension Agronomist

People Providing Products

Rick Johnson, Account Manager and Executive Vice President of Illinois Lawn Equipment, Inc. of Orland Park, IL on the Jacobsen HF-5:

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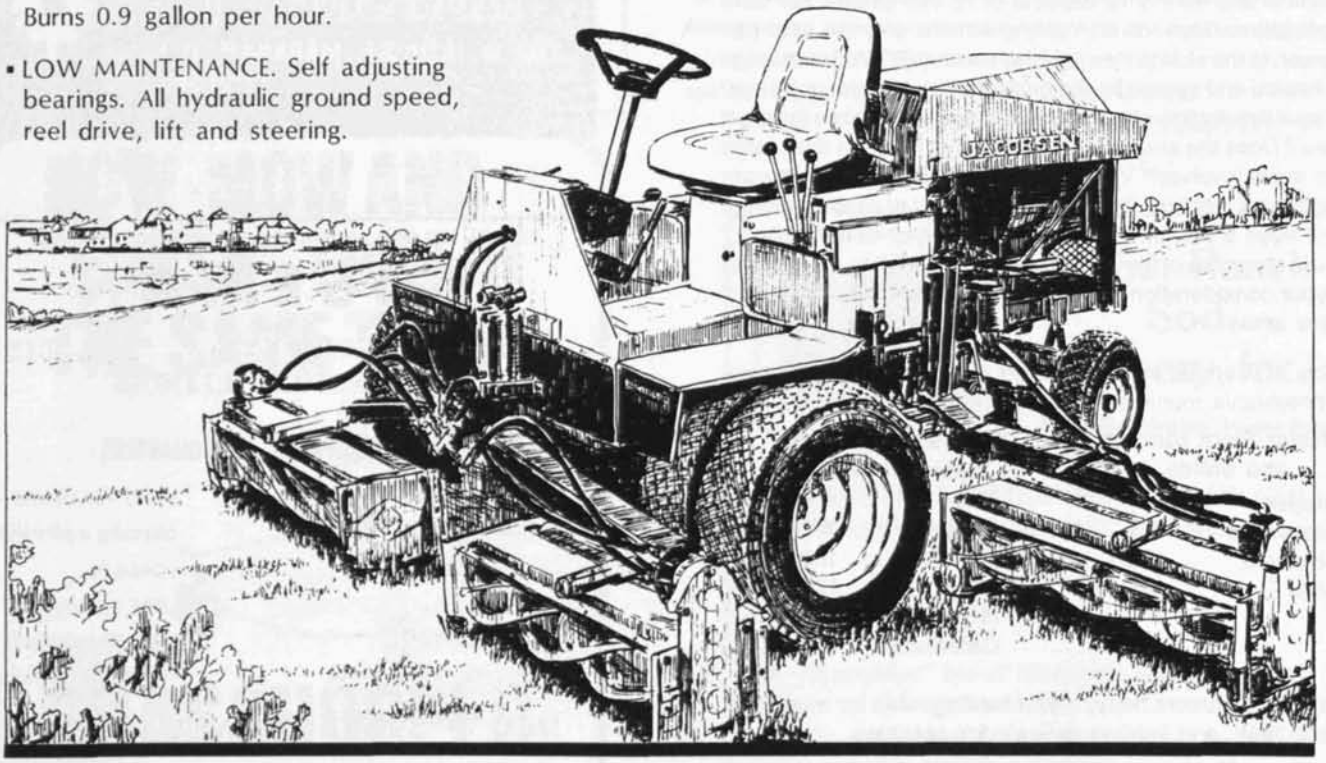

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