state highway weather forecasts, which gives a brief forecast for all the major cities a selected interstate passes through; satellite pictures which include jet streams, high and low pressure areas, and frontal locations can be viewed on your computer screen.

After selecting a topic you wish data on, most times you are then asked to be specific to the area of interest. National maps are available with topics. Some offer detail for portions of the country such as north central, northeast, etc., and others will ask for a specific state and then possibly a specific zone within that state. The service truly is remarkable, very useful and is affordable.

Turf Byte, a bulletin board system for turf professionals, is another useful tool available to us through a computer and a modem. The bulletin board is centered in Lawrence, Kansas, and operated by Superintendent Duane Patton.

This is a great way to communicate with other turfgrass professionals around the country and the only cost involved is a long distance telephone call to Kansas. Messages can be written off-line and then transferred into the bulletin board when connected, saving you connect time. Messages can also be downloaded and saved into a file and then read off-line at your leisure, again minimizing the length of time you are connected.

New ideas, questions, comments, surveys or just casual conversation goes on everyday with Turf Byte. An abundance of good information passes through the bulletin board which anyone can gain from by just reading the messages. I try to call at least once a week and download the messages since I was last connected. I feel this is a valuable service and if anyone would like a message placed on Turf Byte but does not have a modem or computer, I would be happy to put your message on the wire.

Turfgrass Information File (TGIF), located in the library at Michigan State University, is yet another tool available to turf managers through a computer and a modem. Calling the library via your computer is the fastest way to access the turfgrass file; however, information is also available by calling the library on a standard telephone. Whichever way you access the file almost all the information ever written on turf is available to you. By calling via a computer it is like having the card catalog at your fingertips. Information can be requested on a specific subject or by a specific author. Complete articles are not available, however abstracts are and they can be downloaded into your computer. There is an annual subscription fee of $75.00 per year to use this service.

Computers can benefit you as a turfgrass professional. Computer use is everywhere and growing. Just last week I ordered a program called Qqest for our mechanical repairs department. This will keep all the repair parts inventoried and remove them from the inventory as they are used. Preventative maintenance schedules also pop-up when due on a piece of equipment.

Having only been involved with computers for one year, I am very surprised at all the uses I have found in such a short time that greatly assists me at the golf course. It is already hard to imagine doing my job without the assistance of such a tremendous tool as the COMPUTER.

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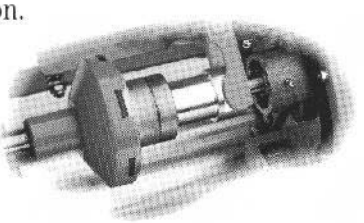

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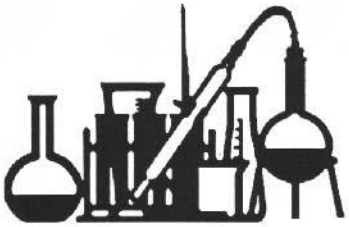


BIOORGANIC TURF FERTILIZERS

By Dr. Wayne Kussow
Department of Soil Science
University of Wisconsin-Madison

The term "bio" has begun to proliferate in the turf world. We have bioregulators, biocontrol agents of various kinds and "bio" is becoming popular in trade names. So why not bioorganic fertilizers?

What I'm talking about of course are the natural organic fertilizers—fertilizers derived from plant and animal wastes. There is growing consumer interest in these products and the industry has responded with a wide array of products and claims. This has prompted numerous telephone calls. Hence, the time seems right to discuss these products in general and examine some of the claims being made.

One thing that distinguishes one bioorganic fertilizer from another is what goes into the product. The list of plant and animal wastes used is almost endless and even varies regionally depending on what wastes are readily available. To name just a few, there's poultry manure composted to varying degrees, alfalfa meal, feather meal, bone and blood meal, tankage, sewage sludge, and even things such as sunflower hull ash. It's this almost endless array of compositions that is one of the distinguishing features of bioorganic fertilizers.

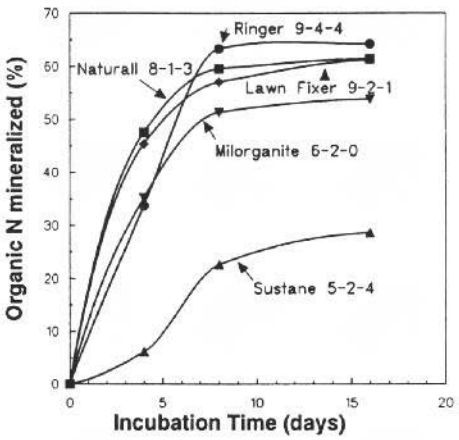
The chemical compounds in synthetic organic N fertilizers are well defined and relatively few in number. Not so with bioorganic fertilizers. There is no way of knowing from information on the fertilizer bag what kinds of compounds are present or in what quantities. The significance of this is indicated by the data given in Table 1. Rates of microbial decay of organic compounds differ greatly. In general, the more complex the compound the slower its rate of decomposition. From this it becomes evident that the rate of decomposition of bioorganic fertilizers and, therefore, the rate of N release is very much dependent on the organic makeup of the fertilizer. Since there is no way of knowing in advance what this is, one cannot readily surmise in advance what will be the N release rate of a particular bioorganic fertilizer.

TABLE 1. Approximate half-lives of some organic compounds.

	Half-life (days)	
COMPOUNDS	LAB	FIELD
Sugars, amino acids	2	8
Hemicellulose	10	60
Lignin	50	1,150

The values given in Table 1 are so-called half-lives. These are the numbers of days required for one-half of that particular compound to decompose. Note the disparity in decay rates under the ideal conditions of the laboratory and in the field. In looking at the half-lives of organic materials, it is very important to understand that if, for example, the half-life is 20 days, this does not mean that the remaining one-half of the material decays in the next 20 days.

FIGURE 1



What actually happens in shown in Figure 1. Here, even under ideal conditions, rates of decay of these bioorganic fertilizers slowed dramatically after about 8 days. This type of decay curve is what occurs for the microbial decomposition of virtually any organic material that contains a wide array of organic compounds. The sharp decline in the decay rate signifies that most of the readily decomposable compounds have been depleted. What remains is slowly decomposable compounds such as hemicellulose and lignin. It may take years for their decomposition to be complete. In other words, the release of N from bioorganic fertilizers is always considerably less than 100 percent and typically ranges between 40 and 60 percent over a single growing season.

Also note in Figure 1 that the percentages of organic N released were somewhat less for Milorganite than for Lawn Fixer, Naturall or the Ringer product and considerably less for Sustane. These product differences reflect differences in the types and amounts of organic compounds present. During their production, Milorganite goes through a short period of microbial decomposition and Sustane, being a composted product, through a much longer period. What is consumed during these periods of microbial decomposition are the more rapidly decomposable organic compounds. What remains are the more slowly decomposable materials. The end result is a slower rate and less complete release of N.

TABLE 2. Elemental analyses of some bioorganic fertilizers

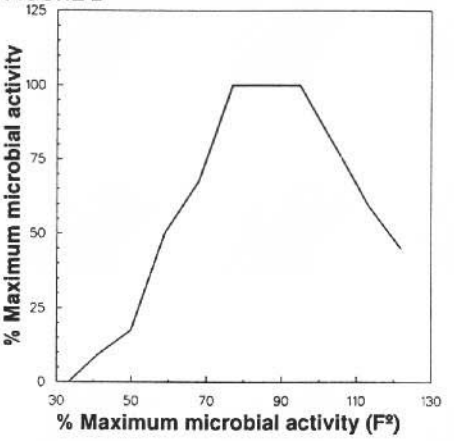
Element	L	N	S	M
	Macronutrients (%)			
N	8.04	8.82	4.43	6.62
P	1.53	0.79	2.35	1.53
K	0.63	3.73	2.66	0.28
Ca	4.03	1.78	4.06	0.78
Mg	0.27	0.41	0.72	0.32
S	1.60	3.28	2.01	0.74
	Micronutrients (ppm)			
B	14.5	27.0	48.6	20.2
Cu	10.1	74.4	151	392
Mo	2.26	4.50	6.75	1,848
Mn	34.5	228	627	88.4
Fe	1,460	9,010	25,700	56,075
Zn	28.6	184	510	1,120
	Metals (ppm)			
Cd	0.49	2.06	5.07	34.9
Cr	9,920	11,000	56.8	4,972
Ni	4.47	11 8	42.8	141
As	115	133	45.2	<33
Pb	9.56	27.9	20.4	276
Se	953	1,050	30.1	542

L = Lawn Fixer S = Sustane
N = Naturall M = Milorganite

Bioorganic fertilizers, being of plant and animal origin, are complete fertilizers in the sense that they contain all of the essential macro- and micronutrients required by plants (Table 2). In some instances the quantities present are very small, probably too small to overcome severe deficiencies, but nonetheless help replenish what is being removed by the turfgrass. There is a common perception that "natural" implies freedom from potentially harmful substances such as heavy metals. As shown in Table 2, this simply not the case and some bioorganic fertilizers contain heavy metals in concentrations that rival or exceed those in Milorganite. I by no means mean to imply here that bioorganic fertilizers should not be used because they inherently contain heavy metals. So does soil and all plants and animals. I simply want to dispel the notion that bioorganic fertilizers are free from these substances. By the way, if you're wondering why some of the bioorganic fertilizers contain high chromium (Cr) concentrations (Table 2), it's because of the leather tankage present.

Nitrogen release from bioorganic fertilizers depends on environmental conditions as well as the types and amounts of organic compounds present. Temperature is a key factor as far as microbial activity is concerned. The dependence of microbial activity on soil surface temperature is shown in Figure 2. Note that temperatures in the range of 75 to 95 degrees are required for maximum activity. At 60 degrees, the activity is only about 50 percent of the maximum. Thus, N release rates from bioorganic fertilizers are notably reduced by early spring and late fall soil temperatures.

FIGURE 2

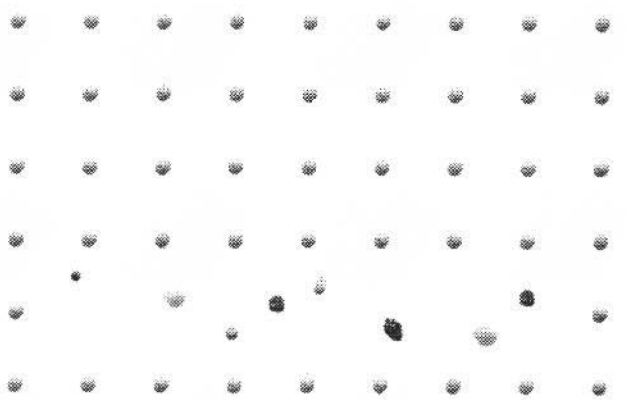


Moisture also affects the rate of release of N from bioorganic fertilizers. While moisture influences on microbial release of surface applied organic N have not been carefully documented, related research suggests that moisture effects are generally secondary to temperature effects. Moisture becomes of major importance only when temperature is not limiting microbial activity. Under this circumstance, keeping the soil surface continuously moist through frequent irrigation can be expected to favor N release from bioorganic fertilizers.

TABLE 3. Inorganic content of some bioorganic fertilizers.

Fertilizer	Inorganic N content	% of total N
Harmony	3-6-3	<0.10
Ringer	9-4-4	7.93
Sustane	5-2-4	16.0
Lawn Fixer	9-2-1	1.75
Milorganite	6-2-0	<0.10

Turfgrass response to bioorganic fertilizer the first few days after application is almost totally determined by the amount of inorganic N (i.e., water soluble N) in the fertilizer. Bioorganic N fertilizers can vary substantially in their inorganic N contents (Table 3). The relatively high inorganic N content of



Sustane is typical for composted products. Composting results in mineralization of some of the organic N originally present.

TABLE 4. Season average color responses of turgrasses to bioorganic and synthetic organic fertilizers.

Location	Type of fertilizer	Number tested	Color rating KB	B
Iowa	Bioorganic	4	7.6	6.2
	Synthetic	3	8.4	5.8
Michigan	Bioorganic	4	8.4	5.8
	Synthetic	2	8.3	6.7
Wisconsin	Bioorganic	5	7.3	7.3
	Synthetic	3	7.6	7.1

KB = Kentucky bluegrass B = Bentgrass

How turfgrass has been found to respond color-wise to bioorganic fertilizers in general is indicated in Table 4. These data show that on a full season basis, bioorganics are capable of producing color responses comparable to those achieved with synthetic organic fertilizers. In general, there are no consistent advantages to using either of these types of fertilizer as far as turfgrass color is concerned. Thus, choice of which type to use should be based on other considerations such as personal preference and cost. Bioorganic fertilizers are not low cost fertilizers. A recent check in local lawn and garden centers revealed that home owners are paying as much as $5.00 per pound of nutrient when they use bioorganic fertilizers. Even lawn care services find it difficult to offer a bioorganic fertilization program for the same cost as for programs based on synthetic fertilizers. On a large scale, one has to factor in additional labor costs arising from the use of the relatively low analysis bioorganic fertilizers.

The argument has been presented that the relatively high purchase price of bioorganic fertilizers is at least partially offset by unique secondary benefits. One of the most intriguing side benefits is that of turfgrass disease suppression. My compilation of what various researchers have found regarding disease suppression appears in Table 5.

What these data tell me is that disease suppression can arise from application bioorganic fertilizers. However, percent times when there has been significant disease suppression are not high enough to look upon bioorganic fertilizers as substitutes for fungicides. They do have some potential for reducing fungicide need in disease control programs, but do not have the degree of reliability necessary to replace fungicides in a disease prevention program. This could change as further research succeeds in identifying the conditions under which disease suppression can be more consistently achieved with bioorganic fertilizers.

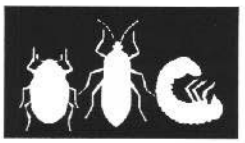
Another potential side benefit that may occur when bioorganic fertilizers are used is thatch reduction. My experience and that of colleagues at Michigan State University is that earthworms seem to be the key factor here. When bioorganic fertilizers have been applied to soils naturally populated with earthworms, earthworm activity often increases and there is an associated reduction in thatch. This is particularly true when daily irrigation is practiced.

In summary, bioorganic fertilizers make a lot of sense from the standpoint of recycling of plant and animal wastes. Excellent quality turf can be obtained through their use. But at the same time, bioorganic fertilizers are not miracle or cure-all products nor are they environmentally safer than synthetic fertilizers.

TABLE 5. Results of studies on turfgrass disease suppression by bioorganic fertilizers.

Disease	No. of Studies	No. of Trtmts.	Trtmts. w/ Suppression	Percent Effective
Gray snow mold	1	10	2	20
Dollar spot	4	31	4	13
Brown patch	4	32	11	34
Summer patch	5	146	46	32
Necrotic ringspot	5	71	42	59
Red thread	1	12	1	8

Wisconsin Entomology Report



Survey of White Grubs Needs Your Help

By Charles F. Koval, Extension Entomologist; Daniel K. Young, Associate Professor; Kerry Katovich, Project Assistant—Department of Entomology, UW-Madison

EDITOR'S NOTE: Kerry Katovich is a graduate student at the University of Wisconsin-Madison in the Department of Entomology. A native of Wautoma, Kerry earned a B.S. degree from the UW-Madison. His areas of interest are insect biogeography and larval taxonomy, especially as they relate to beetles. He plans to develop a white grub key to the species found in Wisconsin, along with details on habitat preferences such as soil type or host plants. Let's help him out, if the opportunity presents itself.

White grubs, which are the larval stages of several species of May beetles and June beetles, are becoming increasingly important as pests of many types of agricultural, horticultural, and forest crops and landscape plants. They cause damage by feeding on the roots of plants. As with many types of soil insects, they can be difficult to control, especially on perennial crops.

We have recently undertaken a study of the white grubs of Wisconsin. Our objective is to determine if there are predictable relationships between white grub species and various environmental factors. For example, we wish to determine if the different white grub species are associated with specific plant (crop), types or particular soil conditions.

To make this a representative and meaningful survey, we need your help. If you discover a white grub infestation, we would appreciate having you contact us, noting the following information:

Your name, address and phone number. State and county where larvae were observed. Specific address where larvae were observed. (Township, range, and section, if known). Approximate depth in soil larvae were found. Brief description of vegetation—include crop and dominant weeds, if present.

In addition to the information, it would be very helpful (but not required), if you could send us some live larvae. Line the interior of a small, sturdy box with a few thicknesses of newspaper. Place the white grubs in the box and cover with the soil they came from. (IMPORTANT: Use only the soil from the grub habitat, as we will be analyzing this to determine soil type.) We would like to receive as many as a dozen of each size (usually, you will find 1-3 distinct size groupings). You may also find pupae and adult beetles in the soil; these can be included also. PLEASE DO NOT include adult beetles that have already emerged from the soil.

Send samples to: Mr. Kerry Katovich, Department of Entomology, 444 Russell Labs, 1630 Linden Dr., University of Wisconsin, Madison, WI 53706 or call:
Mr. Kerry Katovich, Office: (608) 262-2078, Fax: (608) 262-3322, E-mail:
DYOUNG@ CALSHP.CALS.WISC.EDU

To ensure that the larvae do not die in transit, we recommend sending them by overnight mail or UPS.

We have very limited funds for this project, and therefore we will be unable to travel to many field sites. Therefore, all samples we receive by mail will greatly increase the value of this survey. Any assistance will be greatly appreciated.

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THE TRIALS AND TRIBULATIONS OF GOING PRIVATE

By Pat Norton

No doubt we've all heard the expression "how quickly things change".

No doubt that the saying "the only constant is change" is also familiar.

No doubt.

Anyone who knows me (or my employment history) knows that I'm not afraid of change. Change, at the very least, keeps things interesting. Cedar Creek is currently undergoing a very fundamental transformation, or change. Over the winter the 120 members of this club had a chance to complete a comprehensive questionnaire concerning their satisfaction with club operations and facilities.

As you might guess, many people took this chance to vent some frustrations and offer constructive criticism. Most respondents were reasonable in their comments, while others were totally off the wall in both their complaints and their suggestions.

Basically, nobody wins in a club situation where there is a mix of public golf and members. The public generally is very understanding and appreciative of the facility. Members, on the other hand, are a little more critical, expecting more access to the golf course than can really be justified. They do, however, seem to respect the golf course more and definitely do their part in repairing it as they play.

As a result of the questionnaires and for a combinations of other reasons, the owners of this club complex have decided to change the format from public daily fee/limited members to privately owned, private golf membership only with outings limited to two days per week. Sounds complicated to the locals, but very familiar to me after working at Cherokee Country Club for a couple of years.

This format seems to fly in the face of every recommendation ever made for operating a golf course as a profit center. Or does it?

Do all the pluses and minuses involved with a public course balance out favorably when compared to a private club setup?

Does the prospect of owners and staff praying for constantly ideal golfing weather, enabling revenue maximization, leave a question in one's mind?

Does the specter of constantly being money tight in the winter, with relatively little membership income to rely on, leave a bad taste?

Does a golf course superintendent relish the thought of "Joe Golfer" bashing and pounding those poor tees half to death, driving golf cars within inches of huge oak trees, or narrowly missing Aunt Emma with a low line drive tee shot?

Of course not.

Golf investors can usually recoup their investment more quickly from public operations. But it can be pretty uncertain as to Wisconsin weather—early November blizzards and heavy thunderstorms in the spring can make a short golf season even shorter.

Figuring out the arithmetic, going to a private club arrangement makes some sense. If ample members can be attracted who are willing to pay the price, it is a win-win situation. Owners/investors know in advance how much revenue will be available. Budgeting takes on a little more meaning while paying the bills should be less traumatic for the bookkeeper.

The superintendent comes out a winner also, for reasons familiar to us all. The members' desire for quality runs a little deeper, which dovetails nicely with the dreams and ambitions of superintendents everywhere. Ideas formerly out of reach may yet become reality. Wear and tear on the golf course is certainly lessened so that turf has a chance to recover.

Thank God, it's about time!

I am a little uneasy about it all, though. Anybody who is identified with Cedar Creek, even the kitchen staff, get bombarded with the question of "why?".

"Why is Cedar Creek going private," they ask. "Why is access to this lovely facility being denied to us, the golfing public?"

People are genuinely hurt and upset to think that it will be a rare opportunity to be able to play here in the future.

The City of Onalaska even got into the act, portraying themselves as being betrayed by Cedar Creek after promises were supposedly made to always have this golf course available to the golfing public. In return for those assurances, the city allegedly did backflips and cartwheels when cooperation was asked of them by us during construction.

In a way, I do feel some regret about the club going private, although I had no impact on the decision. The public should always have access to quality golfing facilities. On the other hand, people who have been involved with any golf development project know all about the bottom line.

These facilities were built through private investment, not through any sort of public funding. The only true obligation that these owners have is to themselves and to the lending institutions. At some point, this place has got to begin paying for itself. If it is deemed that going private gives us the best chance for long term success, then I am all in favor.

Going private could easily mean some short term cash flow problems until enough members join the club. But in the long run it could have many benefits.

At least for some of us.

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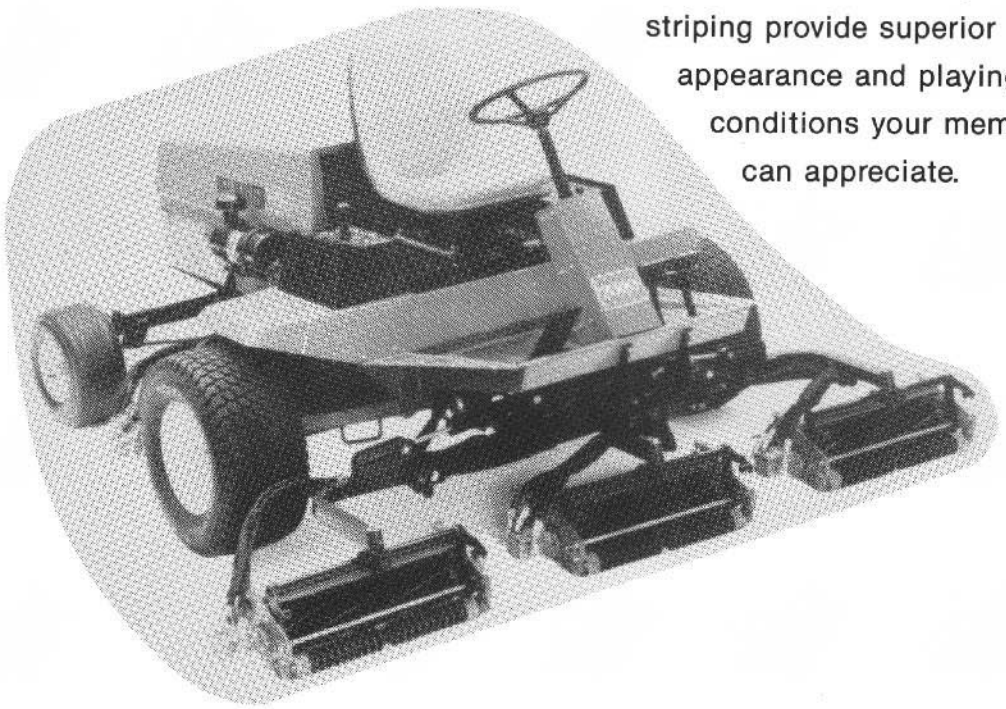

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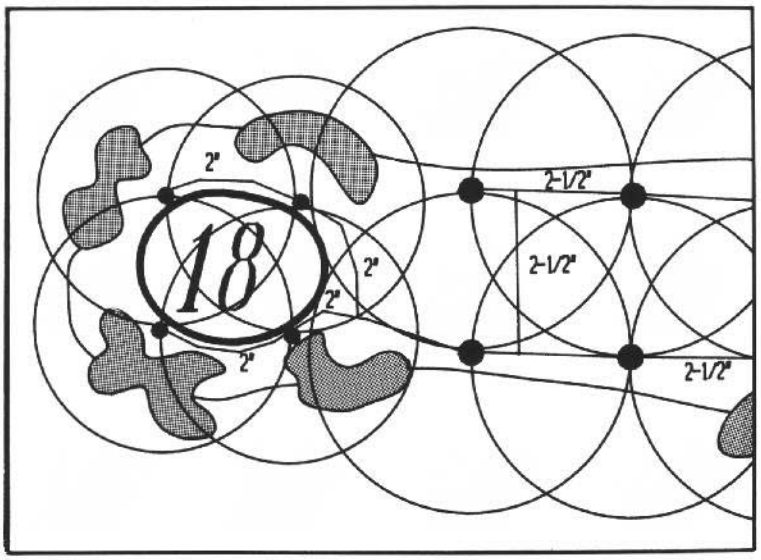

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THE TURFGRASS INFORMATION CENTER —A GREAT RESOURCE IN JEOPARDY?

By Monroe S. Miller

Almost all of us have a place where we really like to be, a place where we are very much at home, comfortable and contented.

For a lot of Wisconsin golf course superintendents that place might be the shop or some corner of the golf course.

For other people, that place could well be a quiet Wisconsin trout stream or a peaceful oak woods.

There are those who like their neighborhood tavern; others have a simpler requirement, like a favorite chair.

Personally, a favorite haven of mine is a spot in a room full of books. Libraries delight me to no end.

Whenever I travel and wherever I travel, I can tell a lot about a town by looking at its library and checking out its newspaper. I do both at every opportunity.

A visitor to my home can tell something about me by surveying my own library. Our family room is home to thousands of books; our shelves are full.

My liking goes to history and the U.S. presidency, sports and nature and agriculture, Wisconsin and New England, American literature classics and travel. You will see practically no fiction.

The first library that caught my fancy was the Dwight Parker Library in my hometown of Fennimore, Wisconsin. The books were housed in main street's most impressive building, and my grandmother was one of the librarians. Once, when I was a kid, I was sure every book ever written was right there in the Parker library.

Since then I have developed quite a list of favorite libraries. The small one room library in Surrey, New Hampshire is special. I was there one autumn evening with Cheryl and my parents. We were researching grandparents six generations back. The librarian had a crackling fire in the fireplace, and our research was fruitful. That snug little building will forever be in my memory.

I really like the Carnegie Library in Howell, Michigan. It is a perfect example of Andrew Carnegie's generosity to many generations of Americans in towns all across the country.

The city library in Springfield, Massachusetts is another classic—an old building with great architecture and very friendly people and a good collection of books.

Wisconsin's State Historical Society Library is a place every citizen should visit. Located on the University of Wisconsin campus at the end of State Street, this is a world class collection in a classic room. I absolutely love it, and as a student I spent many hours studying there. It is a great place to read a book.

Dartmoth College has a wonderful library. So does the University of Michigan Law School. Much of the UM Law Library is subterranean. Yet because of the work of a clever architect, you'd never know it when you are inside. I won't spoil the surprise you'll experience by saying anymore than that.

When Middleton built its new library last year, we were all pleased. The building is very distinctive and inviting from the outside. Inside, it is just what you think a community library should be for its citizens, students and scholars.

I am particularly lucky because my place of work is about five minutes away from one of America's great agricultural libraries—the Steenbock Memorial Library. In 1990, Steenbock was the Wisconsin Library Association's "Library of the Year". The award recognizes achievement in service—read that "user-friendly"—and is a great honor because it uses a peer review process to determine the award.

The Steenbock Library was built in 1968—the year I graduated—and is named for Harry Steenbock. Steenbock was the Wisconsin born and world famous biochemist who discovered the process for enriching foods with Vitamin D.

Our agricultural library had an interesting beginning. In 1888, Professor Stephen M. Babcock, the famous pioneering dairy scientist, donated his first salary check to buy books to establish a small agriculture library.

A year later, William Henry, the first dean of the College of Agriculture, used Babcock's gift to buy a small collection of books. He housed them in South Hall on Bascom Hill. The collection grew and moved to Agriculture Hall in 1903 when the building was completed. The agriculture library was still there while I was a student and moved to Steenbock when those quarters were completed. The agriculture library actually became a department in the College in 1924.

One of my most useful and interesting undergraduate classes was one in library science, taught by faculty in the agriculture library.

There is another library I'd like to tell you about, although many of you may already know more about it than I do.

In many ways, it stands alone. It has all the things I like about my other favorite libraries, and more. This library has turfgrass management as its focus.

Of course, I am referring to the Turfgrass Information Center at Michigan State University Libraries.

It is located in the heart of the MSU campus, a beautiful land grant college I have visited twice. Both times were trips to go to the Center.

This is a place most of you would enjoy visiting. The TIC is found on the second floor of the main campus library. It was started in 1984 and since becoming operational, it has provided students and professors, industry and golf course superintendents and others interested in turfgrass management an enormous resource of information.

The reason for locating the TIC at Michigan State University has a Wisconsin connection. The MSU library is the home of the O.J. Noer Memorial Turfgrass Collection. The Noer Collection includes O.J.'s personal library and over the years it has been supplemented by gifts from all across the country. It has become recognized as one of the best collections in the world of these materials.

One of the goals of the TIC was to provide access to the Noer Collection. MSU was the obvious choice for a home.

The TIC has had three main charges from the beginning:
1.) to provide access to the published materials covering turfgrass research and management. That effort is called the turfgrass information file (TGIF); 2.) to maintain the Noer Collection and expand it, and; 3.) to deliver documents or copies to those in need of the materials. Today, TIC has almost 20,000 references and most of them have been abstracted.

The USGA provided much of the money from the beginning to get the TIC operational and to keep it operating. The GCSAA has been an excellent cooperator and partner in this program.

Not enough can be said about the Noer Foundation and its generous contributions over the years.

It's been my view, unfortunately, that the TIC and the TGIF have been underused by all of us. I am guilty to the maximum. That guilt is overburdened with worry these days.

The free ride for us is nearly over. The USGA Research Committee funding ends early next year. This subsidy has amounted to about $70,000 each year.

What will happen when it's gone?

The USGA has been unequivocal in its expectations from the turf industry; we must assume the responsibility for this great resource. That simply means all of us have to extend our support when the subsidy ends.

As Peter Cookingham, TIC manager, has said, "the reality of funding for academic libraries in the current economic climate, combined with the explosion of information resources, means less attention for subdisciplines like turf culture."

He goes on to say that "the Noer Collection is the finest publicly-accessible collection of turfgrass literature in the world, and perhaps the finest of any. May it always be so."

The Noer Foundation, as noted, has supported the Noer Collection since the beginning and continues it generous support. They want to do more. The void will be the USGA money.

So what can we do, individually and as a group?

The first is to become a subscriber to the TGIF. In the short-term, 500 new subscribers are needed. Jim Belfield and Jerry Kershasky are working on getting 30 new TIC subscribers from Wisconsin, and I'm trying to help them. You can help by becoming a new subscriber for a relatively small amount of money. When approached, please give serious thought to signing up. AND YOU DO NOT NEED A COMPUTER TO MAKE USE OF YOUR SUBSCRIPTION TO TIC.

Once an endowment is established by Cookingham, the WGCSA will have a great opportunity to contribute to this information resource that records our past and will play a major role in our future.

The fate of the TIC is literally in your hands and mine. We simply cannot let this tremendous resource slide away.

Wisconsin Golf Course Quiz

A SOILS TEST

By Monroe S. Miller

Look for the answers to the WISCONSIN GOLF COURSE QUIZ on page 33.

How could any golf course superintendent not be interested in the science of the soil? Soils are, after all, the stuff from which golf courses are made.

Logically, every human being should be a lover of the soil. Without soil, life on this earth would not be possible. Food, clothing and prosperity are all possible, ultimately, because of the soils of the world.

This issue's quiz for Wisconsin golf course superintendents is about Wisconsin soils. Before taking the exam you might want to walk your golf course as a reminder of their importance to you. Do some hand texturing to polish up your practical skills. Scoop up a container of fresh loam from somewhere on your golf course and enjoy the rich aroma.

Then, and only then, with a sharp pencil in hand, sit back and take this Wisconsin soils test.

1. *True or False.* Most often when Wisconsin golf course superintendents prepare topdressing or rootzone mixes, the peat amendment is imported from outside our state borders. I have used peat from both Iowa and from Indiana. The reason, obviously, is because Wisconsin doesn't have any organic soils of significance.

2. Speaking of peat and its value as a rootzone amendment, it is a fact that a cubic foot of peat, when dried, weighs about eight pounds. How much does that peat weigh when it is saturated with water?

3. *Circle the Correct Answer.* The soil texture covering the most area in Wisconsin is (silt, sand, loams/ sandy loams).

4. *True or False.* A routine soil test for a turf area sample analyzed at the State Soils Testing Laboratory in cludes values for nitrogen, phosphorus and potassium.

5. *Circle the Correct Answer.* The average soil pH for the ten major soil regions in Wisconsin is (6.2, 6.5, 7.0, 7.2).

6. The Wisconsin state tree is the sugar maple. The state bird is the robin. The state flower is a violet. What is the state soil?

7. *Fill in the Blank.* When a peat undergoes decomposition it becomes a _____.

8. *Fill in the Blank.* The basic principle of soil science in the USGA Green Section putting green specifications is _____.

9. About 70% of Wisconsin soils are derived from two primary sources. What are those sources?

10. Name the most famous graduate of the Department of Soil Science at the University of Wisconsin-Madison.