

Donators and gifts for WTA fundraiser

Bob Brooker - 2 golf shirts, cap
 Caddy Shack - Ping putter
 Carl Grassl - golf shirt
 Chris Pinkerton - wedge, 4 golf shirts, 5 caps
 Chris Wendorf - 2 Swiss army knives
 Craig Reinders - four x 4-packs of 2002 season Brewer's tickets
 Dan Barrett - dozen balls, 2 sweatshirts
 Don Ferger - 1 prize
 Ed Witkowski - \$50 Kohl's gift certificate, case of Corona beer
 Glenn Gerth - dozen balls
 Janesville CC - cap, golf shirt
 Jim Krieger - 2 golf shirts
 Jim Shone - rain suits, wind shirt, other stuff
 Jim Trzinski - golf shirt
 John Turner - \$150 worth of prizes
 Jon Hegge - cap, wind shirt
 Ken Smith - twosome golf pass with cart
 Kerry Anderson - 2 windshirts
 Marc Davison - 2 sweatshirts
 Marc Schwarting - 2 golf shirts, 1 cap
 Mark Grundman - two jackets, one polo shirt
 Mike Berwick - foursome golf pass with carts
 Mike Lee - 2 books, dozen balls, cap, towel
 Mike Urben - dozen balls, 2 caps
 Neil Radditz - Taylor Made three wood golf club
 Oak Ridge - 1 prize
 Prairie Woods - 1 prize
 Randy Van Fleet - jacket
 Riverside GC - foursome golf pass with carts
 Shawn Hilliard - Wisconsin putter
 Steve Bailey - 1 prize
 Steve Spears - golf shirt
 Tiziani Golf Cars - towel, toy
 Tom Harrison - Ping putter, shirt, dozen balls
 Tom Schwab - umbrella, cap
 Towne Country Club - 1 prize
 Wisconsin Turf Equipment - windshirt

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 United Horticulture Supply
 Waupaca Sand and Solutions
 Wausau Country Club
 West Bend Country Club
 Wisconsin Turf Equipment
 Wisconsin Turf Equipment



Jim Shone from Syngenta hammers a doozy.



Al Nees contemplates his door prize options.



Blackhawk and Evansville CC were well represented at the fundraiser.



Randy Van Fleet trying some trick shots.



A bunch of golf pros from Oshkosh.



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Tuesday, December 11, 2001
8:00 am - 5:00 pm
Ramada Plaza Hotel, Fond du Lac, WI

Continuing Education Units: 0.7
Member Fee: \$120 Non-member Fee: \$180
Code: 02RS060-02

Description

This seminar will cover in-depth information on weed management and plant growth regulator use for the golf course superintendent. Topics include biology, ecology and life cycles of major turfgrass weeds. The development of herbicide resistance by weeds will also be discussed. Management of tough-to-control turfgrass weeds including management of annual bluegrass in putting greens, fairways and golf course roughs will be covered, along with herbicide families and knowledge you can use in weed management.

Instructors

Fred Yelverton, Ph.D. and L.B. "Bert" McCarty, Ph.D.

Textbooks

"Weeds of Southern Turfgrasses"; 11450820; GSCAA Price: \$16.00; Strongly Recommended, but not Required
"Weeds of the Northeast"; 11450880; GCSAA Price: \$27.00; Strongly Recommended, but not Required

MANAGEMENT OF LOCALIZED DRY SPOTS AND WATER REPELLENT SOILS

Wednesday, December 12, 2001
8:00 am - 12:00 pm
Ramada Plaza Hotel, Fond du Lac, WI

Continuing Education Units: 0.35
Member Fee: \$60 Non-member Fee: \$90
Code: 02RS114-02

Description

The occurrence of localized dry spots (LDS) continues to be a significant management challenge for golf course superintendents. There is much confusion concerning the causes, detection and management of LDS. This is particularly true when LDS is caused by hydrophobic soil. Emphasis is placed on our current understanding of those factors contributing to the occurrence of LDS, including LDS caused by fairy ring organisms. Specific management practices that reduce the effects of hydrophobic soils are discussed.

Instructor

Keith Karnok, Ph.D.

Textbook

No recommended or required textbook for this seminar.

UNDERSTANDING BIOSTIMULANTS

Wednesday, December 12, 2001
1:00 pm - 5:00 pm
Ramada Plaza Hotel, Fond du Lac, WI

Continuing Education Units: 0.35
Member Fee: \$60 Non-member Fee: \$90
Code: 02RS238-03

Description

At the conclusion of this seminar, participants will be able to: list the various types of biostimulants currently being marketed; discuss the validity of the various claims made in promotional materials; list the various types of active ingredients found in biostimulants; and explain why some biostimulants have more potential for providing desirable results than others. Attendees will also learn how to test and evaluate biostimulants on the golf course.

Instructor

Keith Karnok, Ph.D.

Textbook

No recommended or required textbook for this seminar.

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02RS060-02, 02RS111-03 & 02RS238-02

Biostimulant Effects on the Microbial Community and Turfgrass Quality of a Sand Putting Green



By *Sabrina R. Mueller and Dr. Wayne R. Kussow*, Department of Soil Science, University of Wisconsin-Madison

INTRODUCTION

Golf course superintendents are constantly being exposed to the idea that the quality of sand putting greens suffers for lack of soil microbial activity that can readily be corrected with applications of a wide array of commercial products commonly referred to as biostimulants. Some of these products contain soil microorganisms, while others claim that their products constituents stimulate native microbe activity. The purposes of this research were to characterize the microbial community in a putting green, to observe how a select group of biostimulants affect that community, and to determine if and how the characteristics of the soil microbial community relate to the quality of the bentgrass on the putting green.

Soil ecologists maintain that a "healthy" soil is one that sustains a large, very active, and diverse population of microorganisms. Through their metabolic processes, the microbes convert plant nutrients from organic to inorganic forms, produce organic polymers that stabilize soil structure, possibly excrete hormones that stimulate plant growth, and regulate plant root pathogen populations. The presumed result is healthy, vigorous plant growth.

Researchers are faced with a daunting challenge when it comes to characterization of soil microbial communities. Merely counting microbe numbers via classical techniques provides very little useful information. Not only are the numbers obtained grossly inaccurate, but no one knows what constitutes an optimal population for plant growth.

In the present research, the microbial community

of a sand putting green was characterized in three ways bi-weekly levels of activity as indicated by assays for four enzymes produced by microorganisms and monthly measures of the range of organic substances the microbes are able to employ as energy sources and the diversity of the microbe population. Repeated measures over time revealed the dynamic nature of the microbial community.

The site for the study was a 3-year-old putting green constructed at the O.J. Noer Turfgrass Research and Education Facility according to USGA standards. Five commercial biostimulants (Table 1) were applied bi-weekly to replicated plots at rates recommended by the manufacturers. The biostimulant applications were in addition to bi-weekly applications of 0.25 lb N/M in the form of Isotek 18-3-16 fertilizer. The control treatment in the study received just the fertilizer.

Soil samples were collected every 2 weeks for characterizations of the microbial community. At the same time, the SR1119 creeping bentgrass on the putting green was visually rated for color, stand uniformity, and the degree of development of localized dry spot (LDS).

OBSERVATIONS

Over the season, 720 assays were conducted for each of four soil enzymes associated with the microbial decomposition of a range of organic compounds. The concentrations of these enzymes provided an index of the level of soil microbial activity.

Data in Table 2 illustrate what was observed with respect to biostimulant effects on soil microbial activity. The data indicate two things: First is that the bios-

Table 1. Biostimulants tested.

Product name	Manufacturer	Major components
Experimental A	Ocean Organics	Seaweed extract & dextrose
Experimental B	Ocean Organics	Seaweed extract & dextrose
Flexx-Plus	Plant Health Care, Inc.	Micronutrients, bacteria, yucca extract
Colonize T&O	Plant Health Care, Inc.	Mycorrhizae inoculum
Raiz-Mor	Jay-Mar, Inc.	Seaweed, plant extracts & surfactant

timulants had only minimal and inconsistent influences on microbial activity; second is the fact that microbial activity declined noticeably as the season progressed.

Biolog plates were used to characterize the soil microbial community in terms of the range of organic compounds it was capable of using as energy sources. This provides information on what is known as the "functional" or "metabolic" diversity of the community. Since different microorganisms decompose different types of organic compounds, knowing how many different compounds the microbial community can decompose also indicates something about the diversity of the kinds of microorganisms in the community.

The Biolog plates contain 95 organic compounds

ranging from simple sugars to complex polymers. Color changes in the plates indicate which compounds were degraded and at what rate. Over 37,000 color readings were taken and analyzed using three techniques commonly employed by soil microbial ecologists. The results of the Biolog assays indicated that (1) the metabolic diversity of the microbial community in the sand putting green was no different than that reported for natural soils in agricultural fields; (2) the metabolic diversity of the putting green declined as the season progressed; and (3) the biostimulants applied had essentially no effect on the metabolic diversity of the microbe community.

The third and final technique used to characterize the microbe community was phospholipid fatty acid

Table 2. Biostimulant effects on soil enzyme concentrations on four sampling dates.

Biostimulant	Enzyme concentration				Full-season mean
	5 June	10 July	1 Aug.	12 Sept.	
----- $\mu\text{mol g}^{-1}\text{soil } 24 \text{ hr}^{-1}$ -----					
Experimental A	5.65	5.25	3.43	4.14	4.31
Experimental B	6.41	6.21	4.71	3.78	4.57
Flexx-Plus	6.51	4.92	4.55	3.44	4.50
Colonize T&O	5.93	4.96	3.86	3.56	4.46
Raiz-Mor	5.80	5.99	3.46	3.78	4.36
None (control)	5.84	5.61	3.49	3.36	4.40

Table 3. Biostimulant influences on visual estimates of putting green quality.

Biostimulant	Means of visual ratings			Frequency of quality improvement % time
	Color	Uniformity	LDS†	
Experimental A	6.68‡	7.45	7.92‡	41
Experimental B	6.67‡	7.50	8.09‡	44
Flexx-Plus	6.62‡	7.51	7.84‡	37
Colonize T&O	6.47	7.25	7.52	11
Raiz-Mor	6.66‡	7.58‡	8.25‡	55
None (control)	6.35	6.87	7.12	--

† LDS, localized dry spot.

‡ Significantly better than the control treatment.

(PLFA) analysis. This technique is based on the fact that the kinds of fatty acids in soil microbe cell membranes are unique to different organisms or groups of microorganisms. This allows for characterization of microbial population diversity.

Due to several technical difficulties, the PLFA did not provide as comprehensive a set of information as anticipated. The data collected did indicate that the numbers and kinds of microorganisms in the putting green were stable over time and were not influenced by biostimulant application.

The influences of the biostimulants on putting green quality are summarized in Table 3. These data show that statistically significant effects were never great, were inconsistent for the majority of the biostimulants, and significant responses occurred only 11 to 55% of the time. Furthermore, virtually all of the significant effects on putting green quality were observed during the first half of the growing season.

When the improvements in turfgrass quality were examined in relation to soil microbial community activity, functional diversity and population diversity, the results were inconclusive. As an example, enhancement of turfgrass color by the biostimulants was significantly and positively related to concentrations of one of the four enzymes assayed, but negatively related to concentration of the other three enzymes. There were no notable relationships between the turfgrass quality ratings and the microbial community functional or population diversity.

The early season improvements in turfgrass color suggest that the biostimulants influenced biocycling or plant uptake of N, or both. Analysis of bentgrass clippings collected on 19 June did, in fact, reveal higher tissue N concentrations when the biostimulants were applied. Clippings collected later in the season indicated no influence on the N status of the turfgrass. At no time did clipping concentrations of the other essential nutrients vary significantly among the six treatments and all nutrient concentrations were well within their sufficiency ranges.

CONCLUSIONS

Enzyme concentrations measured in the putting green were considerably lower than those reported for natural soils in agroecosystems treated with large doses of organic materials such as manure or compost. These observations provide evidence that sand putting green microbial activity is relatively low and the most likely reason is severe limitations in the supply of organic substrates that serve as energy sources for the microorganisms.

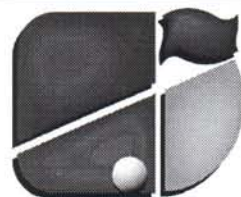
As the season progressed, microbial activity and functional diversity consistently decreased. Our explanation for this derives from the speculation that in this relatively immature putting green where organ-

ic matter levels have yet to stabilize, the primary energy sources for the microorganisms are dead root tissues and root exudates. Coupling this idea with the well-documented fact that when bentgrass is subjected to heat stress in mid- to late- summer, net photosynthate declines and partitioning of this dwindling carbohydrate supply to roots also declines. The net result, then, could well be paralleling reductions in the amounts of root exudates that constitute the major energy source for soil microorganisms. We believe that this accounts for the declines seen in microbe activity as indicated by the enzyme assays.

With this scenario, explanations arise for the failure of the biostimulants applied to have greater and more consistent influences on turfgrass quality and the microbial community. In essence, the biostimulants simply do not provide sufficient amounts of carbon substrates to significantly alter the naturally existing microbe activity limiting supply of substrates in the putting green. With carbon substrate supply being so limiting regarding microbial activity, it is little wonder that adding more microorganisms via the biostimulants had little to no impact on soil microbial activity or functional diversity.

Clearly, there is a great deal yet to be learned about the microbe community in sand putting greens. Until we have a much better understanding of what controls microbe community activity and diversity and how these vary with putting green composition and age, we have no basis for predicting when application of a biostimulant stands a reasonable chance of having a significant influence on putting green quality.

This article is abstracted from Sabrina Mueller's Master's degree research. She completed her M.S. degree in Soil Science in August 2001 and is now working on a Ph.D. in Environmental Biology at the University of Cincinnati. ♣



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Snow (Again!) Welcomes Couples Weekend

Yogi Berra once said it was like "déjà vu all over again." That seemed to be the case for the weather at the 2001 WGCSA Couples Weekend in Minocqua. About two inches of fresh snow covered the ground on Saturday morning, October 6th. It was not quite as severe as the snow that fell for the 2000 event, but it still made everyone snicker a little bit when they awoke that morning and looked out their windows.

The weekend kicked off on Friday night with the vendor hospitality room at the AmericInn in Minocqua. Jim Trzinski, Brett Grams and Bob and Christine Faulks of Waupaca Sand &

Solutions hosted the vendor-sponsored event. Drinks, a fantastic display of hors d'oeuvres and a lot of good conversation helped to get the event started.

Dan and Sherry Barrett of the Trout Lake Golf Course served as hosts for this year's event. Dan assured us on Saturday morning that he would have the course ready for the hearty golfers. Approximately 25 couples put on their extra coats and hand warmers and headed out to the Trout Lake course on Saturday afternoon. Dan and his staff had the golf course in excellent condition. They tested the golf skills of the couples with challenges such as

teeing off from a toilet seat, swinging with a volleyball between your legs, and putting with the world's shortest putter. Needless to say, laughing was a very common occurrence that afternoon!

After the smoke all cleared and everybody thawed out, Greg and Lynn Kallenberg came away with the coveted Mr. & Mrs. Mow title.

On Saturday evening, everyone gathered at Solem's Supper club in Minocqua for a bountiful feast of stuffed walleye and prime rib. Commemorative desk clocks with photos of the couples were presented to each of the participants prior to dinner. The clocks were part of the weekend package

Listed below are all of the vendors who contributed graciously to make the 2001 Couples Weekend a huge success:

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 H.T. Wakefield Technical Services
 Becker Underwood
 Pendelton Turf Supply
 Pro Source One
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 LESCO



Vendor hosts for the event - Waupaca Sand & Solutions.



John Krutilla prepares to embark on the north woods golf journey.

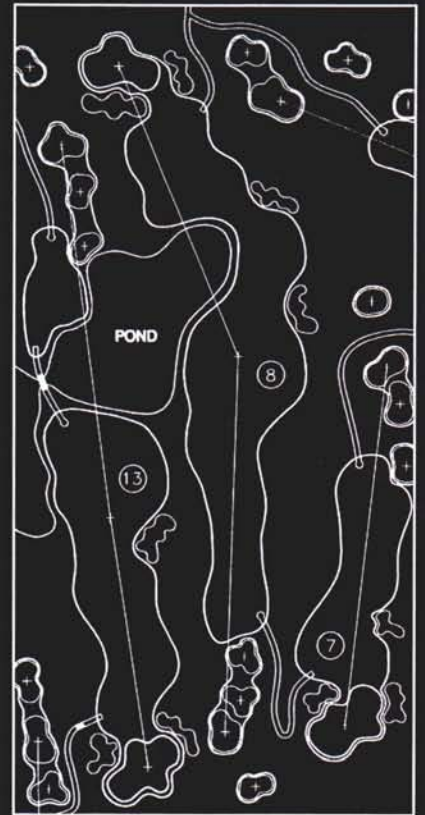


Wayne Otto won the glorious prize of the longest putt with the shortest putter.

Bruce & Mary Worzalla and Rick & Pat Weiterman get ready for tailgating, or was it golf??



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AUCTIONEERS NOTE: Plan now to attend this great auction. Trading will continue until auction day. Some items subject to prior sale. Many more items will be added. For updated list closer to auction date, please visit our web site at www.faheysales.com. For equipment information contact Joel Danielson at 1-800-950-4180. For auction information contact Jim Fahey at 1-888-234-3510.



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donated by the vendors. Randy Witt was the emcee for the awards after dinner. Country music and oldies then filled the air and everyone got a chance to show off their favorite dance steps.

Special thanks go to Dan and Sherry Barrett and the staff at Waupaca Sand & Solutions for organizing the weekend events.

Another thank you should be sent out to all of the couples who attended the event. This is a wonderful WGCSA social that gives special thanks to that special per-

son (wife) who has to put up with us throughout the year.

We hope to see you all at next year's WGCSA Fall Couples Outing. ♡



Jim Trzinski tries his luck at driving off the toilet seat. Dan & Sherry devised different games to test the golfers abilities.

2001 Mr. & Mrs. Mow - Greg & Lynn Kallenberg



Deja vu?? Two inches of snow welcomed participants to the north woods on Saturday morning.



Trout Lake Golf Course—a beautiful venue for the fall event.



Our gracious hosts—Dan & Sherry Barrett.





How Important is Spray Volume?

By Jeff Gregos, Department of Plant Pathology, University of Wisconsin-Madison

If you asked five different superintendents what their spray volume for fungicides is, you would probably get five different answers. You might even get up to ten, as some superintendents use differing spray volumes for greens and tees and a lower volume for fairways. The lower volume on fairways is usually used to reduce the time required to spray the larger acreage. But, how important is spray volume to the efficacy of fungicides of different topical modes of action? After four years of studies and two different diseases tested, it is probably safe to say that volume has little if any effect on the length of efficacy.

While golf courses in Wisconsin contend with many diseases throughout the year, two diseases are far and away of epidemic proportion, dollar spot and snow mold. These diseases probably account for about 80-90% of most golf course fungicide budgets. For some golf courses snow mold control can account for as much as 50% of the fungicide budget or even can be its own line item. Due to the severity of these diseases and their financial impact, it is important to get the most of your fungicide control. Labor costs are also very important. If a job can be done just as well in half the time, that alternative should be evaluated.

Dollar Spot Control on Greens

During the summers of 1998 and 1999 studies were conducted at the O. J. Noer Facility to evaluate the length of efficacy of nine fungicides at three different volumes for the control of dollar spot on greens. All of the fungicides evaluated carry a label for controlling dollar spot on greens height turf. The three volumes used were 1 gal/M, 2 gal/M, and 4 gal/M. The treatments were applied only once, and the area was inoculated seven days after applications (DAT). Dollar spot ratings were taken every five days from 10 DAT until 65 DAT.

Even though there were differences among chemicals this was not unusual as three topical modes of action were used: contacts, local penetrants, and systemics. Most of the differences were among the modes of action and not within the groups. With the different volumes, there were some slight trends noted, but nothing to a statistical degree.

Based on the results in this study, length of fungicide activity was not impacted by spray volume. But, due to the slight trend of better control at higher volumes it would be beneficial to use volumes around 2

gal/M. Another consideration when determining what volume to use is the label. All fungicide labels have required spray carrier volume requirements. Since the label is the law it is always best to follow these recommendations. In addition, the labels are based on years of evaluations and are not just something taken out of mid-air.

Dollar Spot Control on Fairways

This study was conducted exactly as the green study with the exception of some rate differentials for the chemicals used. The study was conducted during the summers of 2000 and 2001. Inoculations and data collection was also conducted similarly.

The summer of 2000 was an ideal season for this



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