

Turfgrass Entomologists From Across the United States Converge in Wooster, OH



By Dr. R. Chris Williamson, Department of Entomology, University of Wisconsin - Madison

Entomologists that study arthropods (insects and mites) in turfgrass recently participated in the National Turfgrass Entomology Workshop in Wooster, OH on March 11-12, 2007. The purpose of this meeting is to provide a venue for the exchange of current issues or pest problems, research ideas and data as well provide insight on the future of arthropod pest management as amongst academicians, graduate students and industry colleagues. The overriding theme of the meeting was alternative, non-chemical control of arthropod pests with emphasis on microbial control strategies including entomopathogenic nematodes and bacterial, fungal and viral control agents.

Without question, microbial control agents are potentially valuable tools that have utility and promise. However, due to limited research studies, comprehensive knowledge and understanding of not only the beneficial, but the potential negative attributes are unclear. Numerous informal presentations were made regarding the use of entomopathogenic nematodes; there were some exciting data presented that suggested entomopathogenic nematodes are capable of providing comparable control (efficacy) to conventional insecticides of several white grub species. Unfortunately, the nematode species used in the studies are not currently commercially available. One explanation is that mass producing entomopathogenic nematodes is not only physically difficult, but can be cost prohibitive, especially when conventional insecticides are relatively inexpensive comparatively.

This meeting also provided a platform for graduate students to showcase their current research project(s). One particular presentation discussed that was especially intriguing was the potential of *Bacillus thuringiensis japonensis* strain Buibui. Based on the information presented, *Btj* Buibui provided consistent control (i.e., > 70%) of 1st, 2nd or 3rd instar Japanese beetle, *Popillia japonica* Newman, larvae. These results are encouraging, especially since 2nd and particularly 3rd instar grubs are often quite difficult to control with conventional insecticides. Another noteworthy study revealed that entomopathogenic nematodes are a viable control strategy for the annual bluegrass weevil, *Listronotus maculicollis* (ABW), problem in the NE United States. Recent research findings suggest that ABW has developed resistance to the synthetic pyrethroid insecticides. For this reason, such information is invaluable.

Finally, this meeting also afforded industry colleagues to present their respective products. In terms of new turfgrass insecticides, Syngenta revealed that Meridian (thiamethoxam) now has EPA registration and is commercially available for purchase and use in 2007. DuPont revealed a new insecticide chemistry, chlorantraniliprole. Chlorantraniliprole is an anthranilic diamide, a novel class of insecticide that is effective against both white grubs and surface feeding insects such as sod webworm and black cutworm; few newly developed products have this attribute. Moreover, this compound has an acute oral LD₅₀ of > 5000 for the technical active ingredient. These, as well as other new insecticides, allow turfgrass managers to maintain an optimistic outlook for the future in managing troublesome arthropod pests in turf while making every effort to sustain environmental quality. 🌱

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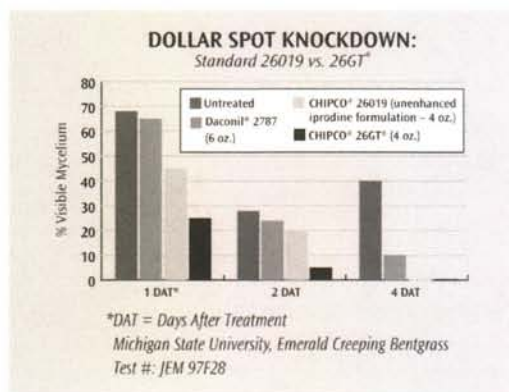
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Sustainable Golf Courses in the 21st Century

By Dr. Doug Soldat, Department of Soil Science, University of Wisconsin - Madison

Unless you've been living in a cave for the past 10 years, you've witnessed the rise of a buzzword: sustainability. It's hard to turn on the evening news or read the newspaper without hearing the word. If you need more evidence, type "sustainability" into Google and navigate through the myriad of web sites that appear. The golf industry has not been immune from the sustainability concept. Ronald G. Dodson is the author of a book devoted to sustainability in golf (Dodson, 2005). The goal of the USGA Turfgrass and Environmental Research program is to "develop turfgrasses and cultural systems with enhanced stress tolerance and reduced supplemental water requirements, pesticide use and costs." Although the word is not used, the sustainability overtones are unmistakable. To make the point that this is a worldwide issue, the R&A (the governing body of golf outside of the USA and Mexico) maintains a web site (www.bestcourseforgolf.org) to help golf course managers "achieve best practices in sustainable course and club management."

Not wanting to fall behind, I enrolled in a course called "Sustainable Development in the 21st Century" a few years ago. One of the assignments was to read *Natural Capitalism* (Hawken et al., 2000). I enjoyed the book because it was a welcome departure from the standard doom and gloom of the typical environmental text. In the book, the authors present the idea that the environmental challenges with which we are presently faced can not only be overcome, but can be used to enhance the economic bottom line. For example, installing super efficient windows may cost 15 - 20% more up front, but heating and cooling costs can be reduced by 97%. In addition to energy savings, smaller (less expensive) heating and cooling units can be installed resulting in an even quicker cost recovery. With the price of energy these days, it doesn't take a mathematician to conclude that those extra up-front costs will be recovered many times over.

This line of thinking sounds familiar, doesn't it? Construct your putting greens correctly now to avoid problems later. Using a pest resistant grass leads to less pesticide use. An extra dollar spent now can prevent three dollars being spent down the road. But there is more to the story than just building things properly. Sustainability also means reducing waste, or finding a use for it. For example, the University of Wisconsin - Madison operates a combined heating and power plant. The waste heat generated in the power plant is captured and used by the heating plant. The "waste" heat is used to heat campus buildings,

resulting in reduced operational costs and significantly lower CO₂ emissions than if the power and heat plants were operated separately.

These two examples illustrate the two ingredients of a sustainable system: #1) use efficient materials and #2) turn waste into something useful. To date, the lion's share of research on improving the sustainability of golf courses has focused on developing resource-efficient grass species and identifying management practices that conserve resources. Drs. Mike Casler, John Stier, and Chris Williamson are leaders in this



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- **Grand Geneva, Lake Geneva, WI** - Winner of Golf Week Magazine's prestigious 2005 Silver Medal for the 8th consecutive year.
- **University Ridge, Verona, WI** - Home of the UW Badgers, ranked #8 in Wisconsin by Golf Week Magazine 2006.
- **Whisper Creek Golf Club, Huntley, IL** - Located within the award winning Sun City, a Del Webb community, and one of the many, very fine courses managed by Billy Casper Golf.

Pumpstation Professionals was founded by Robert L. Cross in November 2001. Bob's background includes a degree in Machine Science along with his experience as a master electrician and electro/mechanical design with an emphasis in high-tech water pumping systems.

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area of research which falls under category #1. This type of research is extremely important, and will continue to be a cornerstone of the sustainability movement in golf. To date, less work has been done to address the second ingredient of sustainability. Natural Capitalism forced me to think about areas where waste could be turned into something useful on our golf courses and below are two areas where we can do better.

Wastewater

Today, the majority of courses built are associated with housing developments. Houses generate wastewater which flows into the sewer system and off to a water treatment plant. As urban growth continues, treatment plants are burdened by high capacity, and use substantial amounts of energy to treat the water. The processes that occur at a wastewater treatment plant are similar to the processes that occur when wastewater infiltrates through the soil or through wetlands. Soils and wetlands are some of our most treasured resources because they have the ability to function like a wastewater treatment plant, and you can't beat the price.

Therefore, an obvious solution to the traditional water treatment system is to create wetlands where the wastewater from homes can be treated naturally. The

naturally treated water could be used to irrigate the golf course. You might be thinking that this is already being done in the arid Southwest and even in humid Southeast. But in those areas, wastewater is generated by the homes, delivered to a water treatment plant, and then pumped back to the golf course. Notice the inefficiency? Not only would the electricity be reduced but also the significant amount of infrastructure and maintenance associated with a sewer system.

One problem that has been identified with effluent water use is that sometimes the golf course needs to take more water than is required by the grass. A solution to this is to incorporate areas for production of a biofuel like switchgrass where any excess wastewater could be applied to avoid saturating the golf course. The biofuel could be harvested and sold for profit or used in heating the local homes, clubhouse, or turf maintenance shop in the winter.

Here in Wisconsin, we wouldn't need to worry much about salinity and sodicity issues in the soil as much as other areas of the US where rainfall is sparse. The spring snowmelt and periodic heavy rains would keep our soils relatively free from salt build up. Sure, we'd need to pay more attention to the quality of our water but these issues are relatively minor compared to the benefits.



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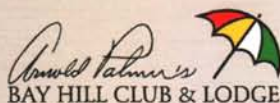
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Carbon Dioxide

Along with water, carbon dioxide (CO₂) is another hot topic in the sustainability arena. Carbon dioxide in the atmosphere is likely contributing the observed changes in climate around the world. It has been long known that grasslands are good at taking CO₂ from the air and storing (or sequestering) it below ground. Recent work has found that turfgrass areas are pretty good at this too (Milesi et al., 2005, Pouyat et al., 2006). But we don't really need researchers to tell us that because we are out there removing the organic matter that builds up each year. Although the turfgrass takes CO₂ from the air and stores it in the soil, the equipment (mowers, pumps, etc.) used to maintain the golf course consumes fuel which adds CO₂ back to the air. My guess is that the CO₂ added by machinery is probably equal to or more than the CO₂ stored by the grass. But to my knowledge nobody can say for sure.

A sustainable system will have zero CO₂ emissions. How can we possibly achieve this goal? In the wastewater example we were utilizing a valuable resource that was being wasted or used inefficiently. While not exactly a waste product, there is energy in sunlight and wind that is not being utilized. Wind and/or solar energy could be converted to electricity. Several electric mowers are available on the market, and Frank Rossi's research suggests that the quality of cut from an electric mower is just as good if not better than that from their gas powered counterparts. Although electric equipment seems to be improving every year, we'll need a sustained effort from the major equipment manufacturers in this area. Fuel use by heavy equipment may be unavoidable, but the majority of fuel on a golf course is consumed by the mowers. And fuel use by these types of equipment could probably be easily canceled out by the carbon that the turfgrass adds to the soil.

We have a long way to go before these goals can become a reality. There are many research questions to be answered, and many technologies that need improvement. Initial investments will be high, but long term payoffs will occur. Possibly more important than the economics of building sustainable courses is the change in public opinion on the impacts of golf courses on the environment that will occur. I think we have an opportunity to force a 180 degree change in this arena. But like Jon Jennings of the Chicago Golf Club said about fairway topdressing at the 2006 Golf Turf Symposium in Kohler, you have to be committed to it. There is no half-way. In the decades to come we need to focus on changing from being a user of water to a wastewater filter, and from contributing to CO₂ in the atmosphere to removing it. The public will have no choice but to recognize the benefits (or ecosystem services, if you're looking for a new buzzword) that golf courses provide. It would be an opportunity to make golf courses *a necessary component* of a sustainable neighborhood

by cleaning wastewater and removing CO₂ from the air. Of course, the golf course will remain a green space for wildlife and a place for the locals looking to blow off some steam after work and on the weekends. It is in the best interest of all organizations with an investment in the future of golf to pursue these avenues and I look forward to helping make this vision become a reality.

Endnote:

You can read Natural Capitalism in its entirety at: <http://www.natcap.org/>

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Around the Corner to Spring

By **Monroe S. Miller**, Golf Course Superintendent, Blackhawk Country Club

Sun Prairie's Jimmy the Groundhog had it about right in early February when he saw his shadow and predicted six more weeks of winter. There were two periods of heavy-duty winter – lots and lots of snow and cold weather – and one caused problems for WGCSA members returning from the GCSAA conference. There was another stormy winter period in early March. But warm days – 60 degrees F. in some areas of Wisconsin – melted the snow and most of the melt water went into the soil.

The moisture was welcome, but the conversation north/south/east/west in Wisconsin after the melt was snow mold. It seems every course had at least a little of it, from the superficial to the serious. But as things dried out at the end of the month, minds were eased as the turf outgrew most of the damage. It won't be a year of winterkill, thankfully, unless crown hydration crops up soon. It could be a nice start to the year.



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NOAA reported the combined land and ocean temperatures for December through February were 1.5 degrees F. above average for the period since record keeping started in 1880.

For the U.S., the winter temperature was near average. Like Wisconsin, the U.S. winter got off to a late start and was spring-like until sometime in January. February brought a return to reality and was the third coldest on record. Last January was the hottest January on record in the U.S.

Dr. Rick Klemme, associate dean of the College of Agricultural and Life Sciences at the UW - Madison, received a big promotion in late December. He will be the Cooperative Extension dean and director for three years, a term that started on February 1.

Rick has been a familiar face in the turf industry. A lot of Extension work goes on in our business – how else are we to learn from the research we support? – and Dr. Klemme has always recognized the significance of the grass industry in Wisconsin. He's in a powerful and influential position and is to be congratulated for such an achievement.

The front page of the Wall Street Journal on one of the days during the week of March 5th featured an article about souped up golf carts. From the dateline in Clamis, California came the story about golf cart drag races on speedways, races in the desert sand, and golf cars modified nearly beyond recognition.

The sport has become so popular that it features a bimonthly magazine (96 pages), shows (Buggy Bonanza) and kits for retrofitting a golf car (Buggies Unlimited). What's next - souped up triplex greens mowers?

I attended the New England Turfgrass Conference during the first week of March. It is one of the best, if not the best, of the regional turfgrass conferences I have attended. The program includes GCSAA seminars on Monday, an awesome equipment show for three days, and an educational program that blends faculty from six northeast states.

My experience over the years has been the northeast has problems similar to ours except that they seem to get them several years before we do.

Regulations, drought and subsequent water issues, diseases, insects, and more all happen there before the Midwest. They also have the lead in solving these problems and we can learn from that. Therefore, it has been a valuable event for me to attend from time to time over the years.

Over the course of a long career I have gotten to know quite a few colleagues from that part of the country and the networking is tremendous. I also was able to stop at Fiddlers Green near Amherst, Massachusetts and visit with Dr. Geoffrey Cornish, golf course architect and author. Standing in the presence of this great man is an experience I cannot describe, other than to say each visit is unforgettable. Also, I had the opportunity to visit with Dr. Joseph Troll, Mel Lucas, Anthony Grosso, Paul Sabino, Peter Salinetti, Ralph Nicotera, Scott MacKintosh, Mark Mungeam and Tim Gerrish, all friends who were attending the show as well.

I also spent a lot of time visiting with a friend of all of ours – Dr. Geunhwa Jung. He is settled in at the University of Massachusetts and lives a short distance from campus. No one doubted he would fit in quickly, and he has. He is off and running with his research program, and we will all be hearing lots from him in the years to come. New



UMass professor Dr. Geunhwa Jung at the NE Turfgrass Conference.

England's gain was Wisconsin's loss.

It was colder there in Providence than it was back in the Midwest, but the four days were spent inside the Providence Convention Center, and they were very productive. Give it a try sometime; you'll appreciate it, too.

So, here we are on the threshold of another season. I am a bit melancholy because I don't have many more left before retirement; this reality may heighten the extreme experience of spring on a Wisconsin golf course.

Best of luck to all for 2007. ♻

The advertisement features a wooden cabinet on the left with a glass door. To its right is a red cooler with a white interior. Below the cooler is a red water dispenser with a white top. On the right side of the ad is the National Golf Graphics logo, which consists of a shield with 'N' and 'G' inside, flanked by laurel branches, with the text 'NATIONAL GOLF GRAPHICS' above and below. Below the logo is the text 'Serving the Golf Industry Since 1989'. At the bottom right of the ad is a small inset image of a red cooler filled with ice.

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