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Annual Bluegrass Weevil: Is There Need For Concern

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

Despite no known reports of the annual bluegrass weevil (ABW), Listronotus maculicollis, in Wisconsin, ABW is likely one of the most problematic insect pests of golf courses in the northeastern United States. Formerly referred to as the Hyperodes weevil, ABW was originally identified as a serious insect pest of highly maintained annual bluegrass (Poa annua) in the metropolitan New York region. Annual bluegrass is its primary host, however ABW has also been reported to lay eggs on, feed and damage creeping bentgrass and perennial ryegrass (Lolium perenne). ABW is now damaging turf in all of the Northeastern states as far south as Virginia, as far west as northeastern Ohio and as far north as southern Ontario and Quebec provinces in Canada. Most recently, damaging populations of ABW were reported in the mountains of North Carolina.

ABW adults spend the winter in protected sites near fairways, putting greens and tees. In the spring as early as late March, typically when Forsythia is in mid- to full bloom, ABW adults will move to shorter-cut turf including fairways, putting greens, tee boxes and surrounds from adjacent overwintering sites. Adult female ABW will begin laying eggs in the inside of leaf sheaths of individual grass plants from mid-April through May. The tiny legless larvae hatch after about a week and spend five larval stages feeding and growing. Smaller (younger) larvae feed inside the leaf sheath, and larger larvae migrate (chew their way down) the plant downward to feed on the crown, feeding damage from larger larvae becomes vary apparent. The larvae pupate in the soil for about a week before emerging as adults in June and July, and this cycle is repeated for a second (summer) generation. Larvae typically develop more quickly in the summer compared to the spring. This is one of the reasons that it is so difficult to track the development of ABW populations in the summer months because of the overlap between insect stages. Thus, it is not uncommon to find small larvae, medium larvae, large larvae, pupae and adults all in the summer.

Weevil damage next to a green site.
(Photo: H.D. Niemczyk, The Ohio State University)

Monitoring for ABW is not complicated, but is very important for making appropriate management decisions. Adults can be readily observed moving on the surface of putting greens, collars, tee boxes and fairways on sunny days throughout the summer. ABW adults can also be easily brought to the turf surface by using a soap disclosing solution (one or two tablespoons of lemon-scented dishwashing detergent in two gallons of water). Larvae and pupae can be easily sampled by cutting a wedge in the turf or pulling a core out of the turf, ABW larvae look similar to grains of rice with a brown head, and pupae are all white with a diamond shape.

Even though ABW has not been reported in Wisconsin to date, the potential for ABW to become a golf course pest in Wisconsin is likely based on the state's similar climate and grass type to that of its eastern counterparts. Currently, the most westward geographic distribution of ABW is northeastern Ohio. For now, it is out-of-site, out-of-mind, but turfgrass managers in Wisconsin should at a minimum be aware and on the look-out of this important and destructive turfgrass insect pest.

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Budget Dollars for 2014

By Bruce Schweiger, Turfgrass Diagnostic Lab Manager, O.J. Noer Turfgrass Research and Education Facility

Winter has been in Wisconsin with a vengeance for months. By the time you read this we could be within week or months of snow melt. That is what makes Wisconsin interesting. The time between snow mold applications and spring snow melt is when we all do most of our planning and define the ways we are going to spend our budgets. Many of you have submitted your budget and they have been either approved or are waiting for final membership re-newels.

How to spend the leaner budgets every year is a task that no one takes lightly. Every year there are new demands and new options for spending you budget, replacement equipment, latest equipment technology, new chemistries, irrigation software and hardware, or just more staff. Having been through this process many times I realize that there are many requests for your budget dollars. I would like to add another area where your budget dollars could be spent. Ok so, that was too many word to get to, why not be a Turfgrass Diagnostic Lab (TDL) Contract member?

The question is why should you spend your budget dollars to be a TDL Contract Member? I could show you the math on what is would cost to spray 25 acres of fairways with a mix of chlorothalonil and Tebuconizole, or what you could save with a proper identification of Brown Patch (Rhizoctonia Solani) so you do not make that Pythium spp. application, but Dr. Koch and Mr. Abler have so eloquently done that for years. I always looked at my contract in a different way and hope you will too.

It is late June and a golfer, board member, committee chair or supervisor comes up to you and says, "My lawn care company was out last week and now I have tan streaks in my yard! What is it? Can you come by and tell me what they did wrong? I want my money back!" OK so we have all heard this or something similar or, "My yard looks bad can I bring you a sample to look at?" Now what do you do? Do you get involved between the lawn care company and the individual? Do you go look at the lawn? Do you tell them you don't have time? Many of you are shaking your heads and can remember these situations and some are even counting how many times a season this happens. The good news is they consider you their personal expert. We all know this can end with one of three scenarios, one you go see the problem and are the hero; two you go and tell them something they don't want to hear and third you do nothing. The first option is a perfect and you are their hero, but scenario two and three can be problematic. People will always remember if you are wrong, perceived wrong or they do not feel you are on their side. As Superintendents we all know that your job consists of multiple talents, agronomy, supervision, and most important public relations.

It is the Public Relations part of your job where the TDL can be of assistance. What would your member or golfer think if you offered to send that sample the University of Wisconsin Plant Pathology Department to the TDL for diagnosis? They could bring the sample to you, no time away from your work, either of you could send it in to the lab with the paperwork. When it arrives at the lab we will make the diagnosis and the proper recommendations. This becomes a win win for all parties involved. Just think of the conversation around the clubhouse after you share your professional expertise. The perception around the course, even to city, would be you are the MAN.

An added benefit is that you would still have the service for your own needs at the course. The next year you can discuss how you have used the TDL for accurate disease diagnosis on the course thus saving chemical costs, labor and best of all putting the least amount of chemical inputs into the environment. The TDL contract can be one of the best public relationships investments you can make. The contract is also an insurance policy for the future. Maybe this year you don't need it but sometime down the road is could come in real handy. Just like your automobile, homeowners and health insurance we all have it but hope we will never use it, but if we need it isn't nice that it is there and then the investment will seem very minimal.

The nice thing about TDL Contracts is they are sold in $100.00 increments, so how much coverage do you need? For each $100.00 you can submit one sample that year and receive a written report for your records. Without a contract the professional diagnosis and written report is a $150.00. With each $100.00 in TDL contract membership you can save $50.00. One long time contract member says he keeps all the reports in a binder for future reference and to show his Green Chair and board the care he is taking of their facility. As a TDL Contract member you receive bi-weekly updates from the TDL on what we have been seeing in the lab or hearing about around the state, or forecast when we see a weather pattern that we think could cause some issues. This bi-weekly service is for contract members only!

A very successful Superintendent once taught me, and I paraphrase, "that with every year as a Superintendent you offend at least 4-6 people without even knowing it. Over time, let say 20 year you may have offended 80-120 people and they all could be board members or committee chairs." My point is, why take the chance that the favor or good deed you do today could create one of those unhappy people?

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A New Way of Looking at an Old Problem

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

Some of you may recall sitting in those wonderful wooden chairs (ingeniously designed to keep you awake) in the Soil Science building and learning about the specifics of nitrogen leaching from Dr. J.R. Love, Dr. Wayne Kussow, Dr. Jerry Tyler, or maybe Dr. Nick Balster (who currently teaches Soil Science 301 at UW-Madison). We learned that fertilizer is normally applied in the ammonium form which is quickly converted to nitrate by microbes. Nitrate has a negative charge, and because soils also have a net negative charge, there is no mechanism for nitrate to be retained like there is for the positively charged nutrients like ammonium, potassium, calcium, and others. Therefore, nitrate is highly susceptible to leaching losses and the recipe for disaster includes: 1) a large application of soluble nitrogen fertilizer, 2) bare soil, or a field with plants too small to absorb most of the nitrogen, and 3) excessive rainfall to transport the nitrate to the groundwater. These three conditions are not uncommon in agricultural settings where soluble fertilizer is the only economically viable choice and logistics usually prevent fertilization when the crop is actively growing. Of course we never quite know what Mother Nature has in store for us in the spring when these applications are typically made.

As we know, turf management is very different from traditional agriculture and for the past three decades studies about nitrogen leaching from turfgrass have found that nitrogen leaching losses from turf fertilization are minor. Perhaps this finding is not surprising because turfgrass fertilization often involves spoon feeding and slow release fertilizers. We also apply our fertilizer to actively growing, nitrogen deficient turf. That means that we are missing conditions #1 and #2 from this list above. There simply isn't much nitrogen hanging around in a turfgrass soil at any given point in time. As a Master's student under Dr. Kussow, I recall applying soluble urea to my sand-based research green and watering it in with irrigation water that contained about 10 ppm of nitrate. When we collected the drainage water, it was almost always less than 2 ppm nitrate. The turf roots absorbed the nitrogen out of the irrigation water as it passed through. My conclusion from that work was that nitrogen leaching is not a major avenue for when typical fertilization programs for putting greens are used. There are dozens of studies that have reached a similar conclusion.

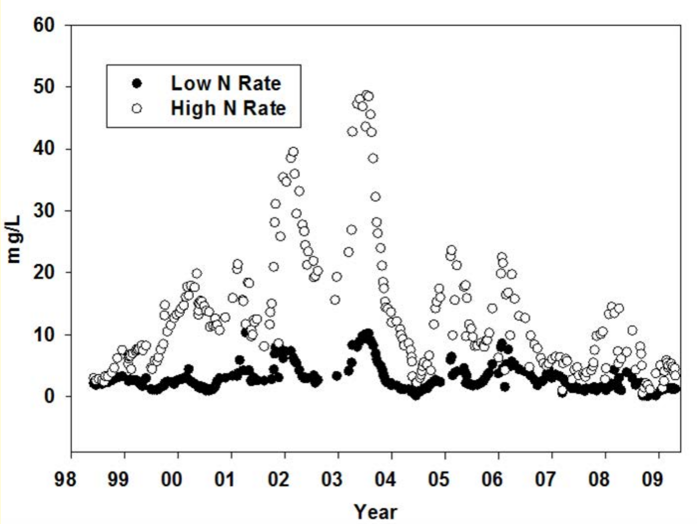

Figure 1. Concentration of nitrate in the drainage water from two mature lawns, one fertilized yearly with approximately 2 lbs N/M (low rate), and the other at about 5 lbs N/M (high rate). The leaching follows a distinct pattern, with high concentrations of nitrogen in the drainage through the late fall, winter, and early spring, with the lowest concentrations found during times of active turf growth. Normally, in conventional agriculture spikes in leaching will coincide with timing of fertilizer application and rain events, that pattern is not evident at all in the turf setting shown above, indicating a different mechanism of leaching is responsible. (Graph courtesy of Dr. Kevin Frank, Michigan State University.)

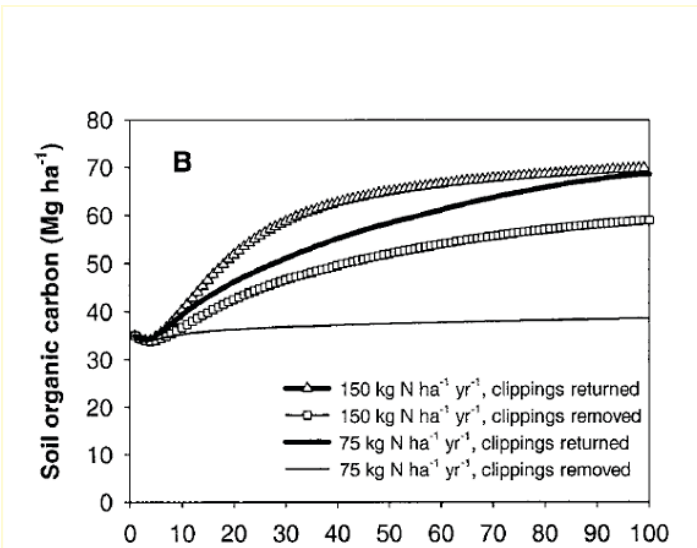

Figure 2. This computer simulation predicts how soil organic carbon (closely related to soil organic matter) changes over time under four different fertilization and clipping management programs. 150 kg N ha-1 yr-1 is approximately 3 lbs N/M. You can see that carbon (organic matter) increases most rapidly in the 3 lbs N/M program with clippings returned. However accumulation rate slows at about 30 years. (Graph from Qian et al. 2006.)

But recently our ideas about nitrogen leaching from turf have begun to change based on some work from Michigan State and Colorado State Universities. In Michigan, Dr. Kevin Frank has observed substantial amounts of nitrogen leaching from a mature fertilized lawn (Figure 1). By mature, I mean it had been fertilized normally for a period of 20 years. There were two interesting aspects to his findings. First, the fact that high levels of nitrate were found at all was surprising given decades of prior work that found the opposite – in fact in the early 1990s scientists at Michigan State studied these same plots and found minimal nitrogen leaching (Miltner et al, 1996). What happened between 1991 and 2001? Why did the nitrogen start to leach?

To answer that, we need to start with the nitrogen cycle. Keep in mind that I am attempting to distill a highly complex situation into a few generalized sentences. When you apply fertilizer to corn and track where it ends up, you often find that about half of the application makes it into the corn plant. Most of the rest ends up in the drainage water as nitrate, with a small amount converted into the gas that makes up 70% of the air we breathe. When we track the nitrogen applied to turf, we find that about half of it ends up in the plant (like corn), but almost none in the drainage water (unlike corn), and a small amount converted to nitrogen gas. The missing portion ends up in the soil as organic matter. This organic matter accumulation can go on for a long period of time, but eventually will taper off because there is a limit to the amount of organic matter a soil can store. At this point, the nitrogen cycle changes, and the nitrogen that used to accumulate in the soil as organic matter will now begin to end up in the drainage water.

Researchers at Colorado State University published a paper that used a computer model to describe what is happening to soil organic matter over time in fertilized turf (Figure 2). If we just focus on the upper most line in the figure, which represents a lawn fertilized at 3 lbs N/M/yr with the clippings mulched, you can see that soil organic matter accumulates rapidly for about 30 years, then starts to stabilize. It is at this point in time when we would expect leaching to start to become an important process. During the accumulation phase, the extra nitrogen in the system is stored in the organic matter, but afterwards it has nowhere else to go. Figure 3 is a graph from the same computer simulation shown in Figure 2, but now shows the expected nitrogen leaching associated with the various management systems. You can see that after about 30 years, the 3 lbs N/M/yr plot begins to show significant nitrogen leaching. None of the other management scenarios do because they are still in the accumulation phase.

So what does this mean? First, this is a major departure from the way we normally talk about nitrogen leaching. Under this new system, nitrogen leaching is predicted to occur when the soil becomes saturated with organic matter, regardless of the rainfall or the timing of the fertilizer application. Second, it means that after the accumulation of organic matter levels off, nitrogen fertilizer requirements should be adjusted downward.

We are still at a very early stage in understanding all this new information. Currently there is no soil test that could determine if your soil is in the saturation phase or beyond it. However, developing such a test is now a distinct possibility that I and others are working on. In fact, this spring Soil Science graduate student Sabrina Ruis visited a number of Wisconsin golf courses to collect soil samples and inquire about fertilization and irrigation history. She is hoping to gain some insight as to how a computer model (like the one used by the Colorado State researchers) and some soil testing information (like clay content, soil organic matter, soil organic nitrogen, pH and others) might be able to predict soil nitrogen saturation and therefore improve upon fertilization recommendations. The Soil Science Department at the UW has a long history of improving soil testing from Emil Truog who developed the first do-it-yourself test for soil pH in 1912, to O.J. Noer who established the first soil testing lab in the US, to Dr. Wayne Kussow who comprehensively calibrated the Bray and Mehlich-3 soils tests for turfgrass. The task is tall in front of us is tall, but the Badger Soil Nitrogen Test has a nice ring to it, no?

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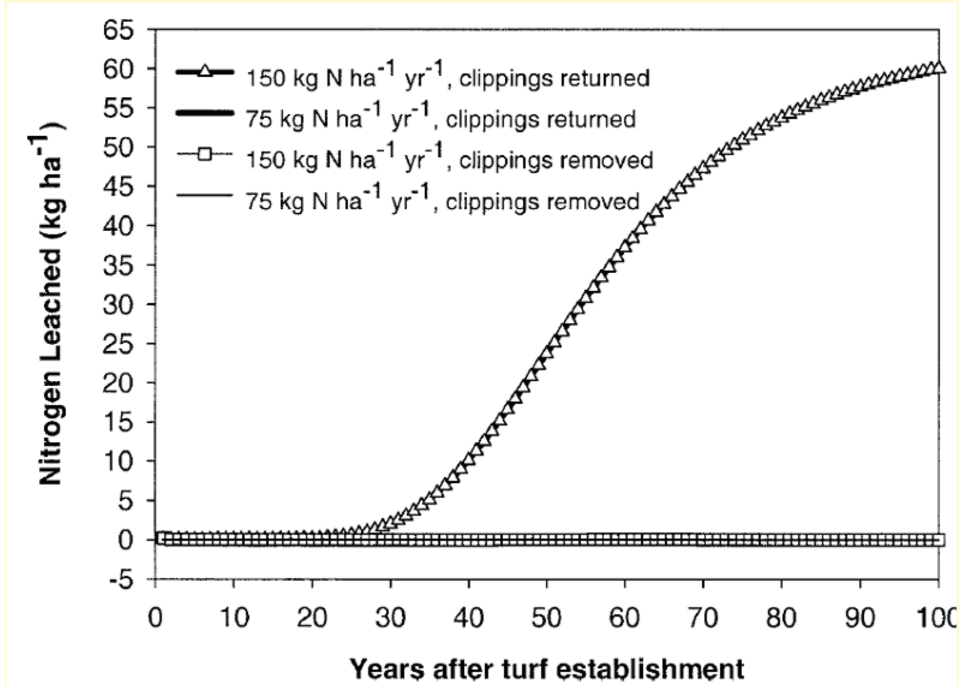

Figure 3. Predicted nitrogen leaching from various turf management scenarios. Only the treatment that received 3 lbs N/M/yr exhibits significant nitrogen leaching, but it took 30 years for the nitrogen to leach. (Graph from Qian et al. 2006.)

Danny Quast Receives Distinguished Service Award

By Monroe Miller, WGCSA Chapter Historian

Editor's Note: *What follows is the narrative of Monroe Milller's introduction of Danny Quast as he was to receive the WGCSA Distinguished Service Award. Miller is the WGCSA Chapter Historian and a 50 year college and friend of Danny's*

Welcome to the 48th consecutive Wisconsin Golf Turf Symposium. In all its history the symposium has distinguished itself as the only real "Golf Turf Symposium" in the county. It has been an excellent way to honor the memory of O.J. Noer, maybe the best known personality ever to emerge from Wisconsin onto the international golf turf scene.

And today it seems the perfect venue to recognize, honor and thank a man whose contributions to golf turf in Wisconsin and across the county have been singular. No one I know has such a broad base of success managing golf courses and related accomplishments. His accomplishments have been in the finest tradition of altruism.

That man is Danny Quast.

Danny was born 70 years ago in Dayton, Ohio, the son of a tool and die maker. His career in golf began when he was 12 and working as a caddy. By the age of 14 he was working on a golf course crew. That interest took him to the University of Massachusetts for a college education in turf. He was a student of Dr. Joseph Troll, attended lectures given by the well known pioneer Lawrence Dickenson, learned from Dr. Don Waddington and came to know Geoffrey Cornish.

With is degree in hand he accepted a superintendent's position at the W.A. Cleary Golf Course in New Jersey. He stayed two years and then moved on to the Troy Country Club, close to his home in Dayton. TCC was a three year stint for Danny before he accepted the superintendent position at the Springfield Country Club, also not far from his hometown of Dayton. At this course he developed a successful poa annua control program using Tricalcium Arsenate, something that wasn't easy to do or done very successfully. Those five years at SCC prepared him for the superintendents position at what was at the time the best known course and club in Wisconsin – Milwaukee Country Club. The year was 1973.

Danny Quast receives the Distinguished Service Award from WGCSA President Chad Harrington

He cut a wide swath at Milwaukee Country Club, and established many friendships all across the state that continue today. He came to know and employ Robert Trent Jones, and trained several assistants for careers of their own.

His success at Milwaukee led to a big league position at the Medinah Country Club in 1989. His stay at the 54-Hole facility lasted 12 years and he left in 2001 to move back to Wisconsin. But before he returned he successfully managed to host the 1990 US Open and the 1999 PGA Championship.

While Danny was in Wisconsin at Milwaukee Country Club he and two friends established a company – DHD. When he returned to Wisconsin after 12 years in Illinois he took over sole ownership of DHD Products and developed it into a well known and reliable turf distributor in southern Wisconsin.