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by Rob Thomas

PROPER I.D.

Correct bug identification allows you to better manage their threats to your turf.

Contrary to the popular idiom, what you don't know can hurt you. If you think you're managing the bugs on your golf course correctly, take a moment to consider there may be an even better way to handle these potentially harmful pests.

Juang-Horng "JC" Chong, Ph.D. of Clemson University says a common misconception among superintendents is that they don't need to identify white grub species. After all, if they all look the same, they can manage them the same way. Right?

Wrong.

"This attitude/myth perhaps cuts across all insect pest groups and is largely the result of complacency or laziness, in my opinion," Chong says. "In fact, it is quite important to identify the white grub species that is causing the problem because each species has different life cycles and, therefore, requires slightly different management approach."

To complicate the problem, dominant species seem to change from location to location, Chong says. For example, in South Carolina, the dominant species along the Coastal Plain are the masked chafers and the May/June beetles (*Phyllophaga spp.*), while the Japanese beetle is added to the mix in the Piedmont and Mountain regions. The masked chafers have a one-year life cycle and the peak activity in South Carolina is between late May to late July; the Japanese beetle has a one-year life cycle and is active mid-June to August; the *Phyllophaga* has a three-year life cycle and is active from late May to mid-August.

"Ideally, preventive treatment of white grubs should be tailored to the activity period of the adult beetles and long-residual insecticides applied to the soil before or at the onset of the activity period," Chong says. "Curative treatment in July and August using fast-acting, short-residual insecticides is more appropriate for courses that had a sudden, damaging white grub population. Preventive treatment usually works a lot better than curative. Typically one preventive application with neonicotinoids in mid-May will do the job for the rest of the year; but this is only true for the masked chafers and the Japanese beetles, which have grubs of the same age and all got wiped out at the same time. But for *Phyllophaga*, if the infestation has been there for a while, there are likely grubs of different sizes.

"Preventive treatment kills the young *Phyllophaga* grubs, but another curative treatment may be needed to deal with the older, larger grubs or be prepared to suffer a little more damage until the larger

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> "Most superintendents treat insects based on what kind of budget they have. Golf courses with larger budgets and higher expectations for no-insect or pest damage tend to use more preventative treatments that might cost more to treat larger acreage areas to ensure no damage. Courses with smaller budgets might use insecticides on a more limited and curative basis."
>
> - *Matt Martin, North Carolina State University*

grubs pupate next spring," he adds. "If the species can be identified, then preventive treatment can be applied at the best time; the superintendent can minimize the need (time, labor and materials) to do a curative treatment later on."

Matt Martin, turfgrass extension associate in the North Carolina State University Crop Science Department, deals with white grubs, too, as well as other insects that are common from Texas to North Carolina including mole crickets – both Southern and Tawny – billbugs, sugarcane beetles, armyworms, black cutworms, nematodes and occasional outbreaks of Bermudagrass.

"Most superintendents treat insects based on what kind of budget they have," Martin says. "Golf courses with larger budgets and higher expectations for no-insect or pest damage tend to use more preventative treatments that might cost more to treat larger acreage areas to ensure no damage. Courses with smaller budgets might use insecticides on a more limited and curative basis."

Chung thinks tight budgets – forcing the need to minimize labor and equipment costs – has led to superintendents incorrectly putting out preventive treatment for white grubs at the same time as preemergent herbicides. He warns superintendents to beware of the counterproductive possibility.

"One of my previous studies showed that neonicotinoids and chloratraniliprole provided less than 60 days of residual, preventive control against Japanese beetle eggs and young grubs in the sandy loam soil in South Carolina," Chung says. "So, if the insecticides are put out there way too early in the spring and, when the adult beetles show up and start laying eggs at the tail-end of the residual efficacy, then the efficacy of the preventive insecticide treatment will be greatly discounted.

"When that happens, the turf will suffer damage and the crew will have to go out there and do a curative treatment ... more time, labor, material and money," he adds. "So, for a golf course that suffers persistent infestation by white grubs, it may be best to do preventive treatment at, or just before, the flight period of adults."

Martin feels as though many superintendents think treating for insects for a certain amount of time means they won't be back.

"The truth is that most insects have life cycles that may be altered due to the local environment that they are reproducing," he says. "Changing weather patterns from year to year can significantly [alter] insect life cycles from year to year and their reproductive success. Wet years versus dry years or cooler weather versus hotter weather might affect how insects behave.

"Some insects also can have fluctuations in populations and show up more sporadically during a decade or longer, rather than showing up every growing season," Martin adds. "An example of this in the southeast United States is the sugarcane beetle. Many golf course superintendents battled this insect 20-25 years ago and then it seemed to go away. Within the past five years we have seen a resurgence in this insect throughout golf courses in this area."

Martin recommends a proactive approach in battling turfgrass bugs.

"In many cases, some of the newer preventative pesticides are extremely effective for certain insects for long-term control," he says. "Map critical damage areas at the end of the growing season to know areas that need to be treated the following year. Also, keep in touch with local golf course superintendents to see what kind of insects they are dealing with in a given area."

According to Martin, most golf course superintendents he deals with are very proactive to identify insects before treatment. He says they understand the environmental and economic benefits to only treating insects that might damage the turf. And most use university entomology labs or local extension offices to facilitate the identification process.

Professor of entomology Rick Brandenburg – also at North Carolina State University – battles the misconception of insecticide resistance.

"So many times when a product doesn't work, the user claims insecticide resistance," Brandenburg says, though really we're "only seeing it right now in annual bluegrass weevil in the New England [region]. "That is not why the product didn't work in most cases. We really are not having any issues with resistance right now other than the annual bluegrass weevil."

Also on Brandenburg's list of bug myths to bust: A cold winter means fewer insects next year and a mild winter means more insects. False, he says.

"Each region has insects well-adapted to its region," he points out. "There are insects in Alaska. If a cold winter hurt insect populations, it would also negatively impact the beneficials that keep them in check. While there are examples of this, like fire ants at the northern fringe, it simply is not true as a general rule."

And don't tell Brandenburg today's new products aren't as good as the older ones. "Wrong," he says of that notion. "Today's new products are awesome. Lower use rates, long residual, great environmental profile, work really well against the target pests, etc."

Or the higher the rate, the better the product will work. That's simply not true.

"We have seen time and time again that really high rates can often repel insects and they avoid exposure and the treatment does not work as well," he says. "I see this often

in mole cricket control."

Lastly, but less aggressively, Brandenburg disputs that more irrigation to water in a product will always be helpful.

"We have not observed this to be true," he says, offering a blueprint for success. "A light application prior to treatments and a modest irrigation after application are a good recipe for improving control of soil insects like white grubs and mole crickets."

R. Chris Williamson, professor of entomology at the University of Wisconsin-Madison, takes a different approach to the thought of attacking bug myths. After all, why is the industry so quick to assume it's a bug in the first place?

"Insects may not necessarily be the cause of turf damage despite one's initial thought," Williamson says. "It is critical to properly and accurately diagnose the cause of turf damage. To do so, sampling and monitoring of the damaged turf area is an effective means to accurately assess the cause of the turf damage.

"Other issues including biotic (e.g., disease pathogens) and abiotic factors (e.g., heat stress, drought stress) may be responsible for the turf damage," he continues. "One classic example is vertebrate damage by birds on golf course putting greens. Superintendents often equate bird feeding damage to the incidence of insects such as black cutworm or sod webworm caterpillars. Birds not only feed on insects, but certain bird species prey on earthworms, seeds and other non-turf insects."

Why are we eager to point the finger at bugs? History, Williamson speculates. But just because something has always been seen or done a certain way, does that mean it's the right way? Of course not, he says.

"Some of these myths are based on hearsay or legends that have been passed down over the years," he says. "In addition, the [amount] of research as it relates to these myths or legends is rather limited. Because research is not available for all of the problematic turfgrass insect pests, the truth lies somewhere between fact and fiction (myth)."

Unfortunately, misconceptions can cause a superintendent to choose to apply an unnecessary insecticide application, Williamson says.

It's not all doom and gloom from Williamson's perspective. By minimizing these fictitious beliefs, the superintendent and the budget can benefit. "By appropriately and accurately diagnosing an insect problem and dispelling the myth, a superintendent can mitigate an inappropriate insecticide application – consequently reducing cost and manpower." **GCI**

Monroe Miller retired after 36 years as superintendent at Blackhawk CC in Madison, Wis. He is a recipient of the 2004 USGA Green Section Award, the 2009 GCSAA Col. John Morley DSA Award, and is the only superintendent in the Wisconsin Golf Hall of Fame. Reach him at groots@charter.net.

FOREIGN SERVICE

Overseas duty may be an exciting and lucrative goal.

For as long as I can remember I have been a book guy, but never more so than since I retired. Reading requires time, and I have had more of that these days.

I just read the autobiography of a Wisconsin-born-and-educated Roy Chapman Andrews (1884-1960). Born in Beloit, he knew he was going to work outdoors for a natural history museum and explore the world.

His first job after graduation from Beloit College was at the American Museum of Natural History in New York City. He started as a janitor and ended up museum director.

Andrews was a superstar during his working years and made five daring journeys into unexplored territory in central Asia, especially Mongolia and the Gobi Desert. The trips were well-organized and resourceful and set new standards for exploration. His trips scored unbelievable treasures that helped explain the history of the Earth and man. During his career Andrews collected whales, seals, mammals, reptiles and just about any animal you can think of; many are still on display at the museum. His autobiography, recently reprinted, is titled "Under a Lucky Star." Discover magazine lists it as one of the 25 most outstanding science books ever written. So exciting was his life that there are persistent rumors that R.C. Andrews was the person the popular movie character Indiana Jones was based on. I don't know if that is true or not, but even the rumor gives evidence of how exciting his adventurous life was. Andrews' friendship with Douglas Fairbanks and Fairbanks' desire to do a movie of Andrews' life probably inspired the rumor.

So what has this to do with those in the golf course industry? It has to do with the difficult job faced by college grads who graduate with a degree in turfgrass science, as well as experienced and qualified superintendents looking for a golf course. In my life we have gone from a place where a new grad went directly to a superintendent position to now where a new grad may hope for a second assistant position or a job as a spray tech.

> "In my life we have gone from a place where a new grad went directly to a superintendent position to now where a new grad may hope for a second assistant position or a job as a spray tech.

We have gone from a time when we built a golf course each day in America that had to be staffed to today where there is little new domestic golf course construction. I have read that many golf course architects are now working almost exclusively overseas, especially Asia (the places where Roy C. Andrews spent so many exciting years). Some of those architects have even moved there.

So, there it is. Maybe overseas duty as a golf course superintendent is not only an option, but also an exciting and lucrative goal. It could be that an undergrad turf science option would include coursework in international relations or studies. Might the coursework include intense study in foreign languages – Chinese or Russian or Korean, for example? Construction of new golf courses in Brazil could be a catalyst to learn Portuguese. Wouldn't it be valuable for a developer to have the chance to hire someone so well-educated and prepared for a turf career in foreign service? It certainly seems plausible to me.

I have visited with any number of colleagues who have worked overseas. Steve Cook and his wife Robyn enjoyed their time in Europe. Mel Lucas has spent time overseas and has fascinating stories. A friend loaded up with greensmower parts before he left visits Wisconsin to go back to his position outside the U.S.

Such a career aspiration isn't for everyone. What if you are married and ready to start a family? Do you want to do that in a society very different from ours? What if you already have children – do you want to be separated from them? What about health care and safety issues?

On the other hand, there are tax advantages to working across either ocean. I didn't investigate what they specifically are and what they could mean. But it seems a few years overseas at a good salary and low or no tax obligations could set a person up financially for years to come.

There are no easy answers when considering this as a career path; it is a highly individual thing. Read "Under a Lucky Star" and see how adaptable Roy Andrews was and how he prospered.

Are there any turfgrass Indiana Joneses among us? **GCI**

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BY JOHN TORSIELLO

Some of the best material to topdress fairways and other portions of a golf course may be right under a superintendent's feet... literally.

Research has shown that using compost gathered in a variety of ways, including grass clippings and other routine maintenance activities, can have positive affects on a variety of grass strands, especially fairway-cut creeping bent grass and *Poa annua* strands. A recent study by Ohio State University researchers and industry experts, among them Dr. Michael Boehm and Dr. Joseph Rimelspach, demonstrated that color and foliar-nitrogen concentrations were positively affected for up to 50 days after topdressing with a locally available compost sludge. The report cited research at Ohio State and elsewhere has documented the disease-suppressive qualities of some composts and that composted material can improve soil fertility and physical structure.

Most composts used by superintendents are produced by piling fresh organic matter and stacking the material, which stimulates decomposition by microorganisms. As microbes involved in the process degrade organic material, they generate a great deal of heat, which, in turn, kills or inactivates many weed seeds, as well as plant, animal and human pathogens. The microbes exhaust the available carbon and nitrogen, the composting slows and the pile begins to cool. Other microorganisms, including wind- and rain-borne types, may then colonize the pile. During the final curing stage, microbes proliferate, including some that are capable of suppressing plant pathogens such as pythium. After compost cures adequately, producers typically screen it and it is then ready for incorporation as topdressing.

Dr. Tom Samples, extension specialist of turfgrass management at the University of Tennessee, is a proponent of topdressing turf (but not usually golf greens) with appropriate organic materials, such as high-quality, well-decomposed compost, in certain situations and immediately after core aerification. He says the suitability of heavy clay soils for maintaining turfgrasses may be improved by routinely core aerifying and lightly topdressing with a high-quality organic material.

He cautions, "Unfortunately, some organic materials contain a high level of soluble salts and can be detrimental to turfgrass growth and persistence. This can be especially problematic in areas of the country that receive very little rainfall."

He adds that depending on the source(s), organic matter may also contain significant amounts of heavy metals and toxins that can be very detrimental to turfgrass plants. "One goal when using compost as a topdressing material is to increase the organic matter content and water-holding capacity of the root zone soil below the thatch layer. In order to do so, the topdressing material must be moved below the thatch layer, which magnifies the need to core aerify just before topdressing."

Dr. Samples cautions that topdressing turf with organic matter does not ensure that the population of beneficial microorganisms in the soil will rise.

Dr. John Sorochan, assistant professor of turfgrass science at the University of Tennessee, says there are several types of compost materials that can be used for topdressing turf, including decomposed organic waste products, poultry, and yard waste materials. "However, it is important to make sure the compost materials are fully decomposed (beyond the thermophillic stage)." In addition, the compost should be ground and screened to remove any large debris. Finally, composts may contain toxins. Therefore, it is important to know the source and history of the compost product.