
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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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.

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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**