THE OHIO TURFGRASS FOUNDATION MAGAZINE | SEPTEMBER/OCTOBER 2015 | Vol. 77, No. 5

OTF
OHIO TURFGRASS FOUNDATION

TURF NEWS

GOLF • SPORTS TURF • LAWN CARE • SOD

OTF Member Intro:
Mark Jordan, Westfield Group C.C.

OSU Coach Tom Ryan to Deliver
2015 Conference Keynote

New (and Newer) Options for

Insect Control on Sports Fields

NEW (and Newer) Options for INSECT CONTROL on Sport Fields

By David Shetlar, Ph.D., Professor of Urban Landscape Entomology, The Ohio State University, OSU Extension & OARDC

I'm always a bit nervous about using the word "new" when talking to my industry colleagues! What is new to one person may be well known by another; hence, the "and Newer" qualification to the title of this article. For those of you who attended the OTF Conference and Show last December, the information in this article won't be new, but it's always good to go over this information several times in order to get everything down correctly.

Dozens of pests can affect sports turf facilities, so I'm going to limit this discussion to billbugs, white grubs and the turfgrass ant. Billbugs and white grubs can cause dead turf or, at least, turf thinning and weed establishment. The turfgrass ant is the little ant that establishes in skinned areas of baseball fields. The mounds and the ant activity are often blamed for erratic ball hops or distracted players!

Let's first look at the new and not-so-new "tools" that are available to manage turf pests. For those of you wanting (or needing) true bio-based options, we have good news! There are two new insecticides based on microbial (bacterial) insect toxins.

Bio-based products

The first product is GrubGONE™ from Phyllom that is based on *Bacillus thuringiensis* strain *galleriae*. This strain produces a toxin that affects beetle larvae. We have tested it against white grubs (Japanese beetle and masked chafer larvae), bluegrass billbug larvae and the annual bluegrass weevil larvae. It has performed consistently quite well (averaging 70% to 75% control). While some consider this product to be a biological control, the bacterium doesn't actually reproduce in an infected insect. The bacterium lives on decaying organic matter, but some strains produce toxins that can kill insects if the toxin is ingested. Hence, it is a microbial pesticide, but most organic farmers consider this to be close enough to warrant the designation of "organic."

Table 1 contains data that we generated in a 2011 study where we applied the product in late June, mid-July and early August. Each application time resulted in satisfactory grub reductions. We have repeated these tests in subsequent years with the same results. This summer, we tested it against the annual bluegrass weevil, and we achieved 75% to 80% control of the larvae. If you plan to use this product, our best recommendation is to apply it when white grubs are in their first instar stage (late July into early August), and be sure to irrigate in the product if possible.

Grandevo™ from Marrone Bio-Innovations is based on a new bacterium, *Chromobacterium subtsugae* strain *PRAA4-1T*. While this product is on the market, I'm a bit reluctant to eagerly recommend it until we do some more testing (or until I see more test results from my fellow turfgrass entomologists). We have tried it against white grubs and billbugs, but the control was often poor and inconsistent. Against caterpillars (sod webworms and cutworms), control levels were more satisfactory.

Somewhat of a surprise was that Grandevo affected chinch bugs in two of our tests. Most microbial pesticides must be ingested to have an effect. Since chinch bugs suck juices out

Table 1. Evaluation of GrubGONE™ for white grub control in lawn turf (Lancaster, OH), 2011.

Treatment	Rate (lb. AI/A)	Date Applied	% Control
GrubGONE G	2.5	June 30	83%
GrubGONE G	4.0	June 30	80%
GrubGONE G	2.5	July 13	70%
GrubGONE G	4.0	July 13	80%
GrubGONE G	2.5	August 8	80%
GrubGONE G	4.0	August 8	78%
GrubEx (imidacloprid)	3.0	June 30	85%
Meridian 0.33 G	0.26	July 13	98%
Meridian 0.33 G	0.26	August 8	98%

Study evaluated on October 7; 5.0 grubs/ft^2 in checks (masked chafers and Japanese beetles combined).

of grass stems, the only logical way that this product could knock them out would be by contact toxicity. Stay tuned! Hopefully, there will be more information on the performance of this microbial insecticide in the near future.

Non-bio chemistries

An anthranilic-diamide insecticide in the same chemical category as Acelepryn™ was registered in 2014 by Syngenta — Ference™ (active ingredient cyantraniliprole). This was registered for annual bluegrass weevil control, but it also includes grubs, billbugs and caterpillars on the label. Ference is more water soluble than Acelepryn, so it moves more quickly into plants. The downside of this is that the molecule also dissipates faster. Unless you have an annual bluegrass weevil problem (not normal in Ohio sports fields), I see little reason to use Ference over less-expensive products.

Speaking of diamide chemistry, Acelepryn should be high on the list of any sports turf manager! The toxicity and environmental profile of this molecule make it ideally suited for use where people are constantly using the turf. Acelepryn is the first turfgrass insecticide that has a true EPA designation of practically non-toxic (category 4, LD50>5,000) and it poses little risk to fish, birds, amphibians, reptiles and amphibians. It also has little adverse effects on honeybees or other pollinators. This is the only insecticide that can be used on turf that has the following EPA notification: "[NOTE: NO SIGNAL WORD is required for this product]." That's correct — no "caution," no "warning," on the label.

For sports turf managers who are working for schools or municipalities, using the "least toxic" products is often mandated. Even if not mandated, it's always easier to discuss pesticides with a concerned parent or citizen if you can state that the product meets the US-EPA standard of "practically nontoxic!"

In our evaluations, Acelepryn provides excellent, season-long control of white grubs

PHOTO 1 White grub damage. Notice how much of the surrounding turf has died, due to grubs feeding on the grass roots.

PHOTO 2 Side profile of a white grub just under the soil surface in the rootzone.

PHOTO 3 Billbug damage with frass at the bottom of the grass roots.

PHOTO 4 Lifecycle of the Japanese beetle.

PHOTO 5 Lifecycle of the billbug.

PHOTO 6 A mound of the turfgrass ant.

PHOTO 7 Turfgrass ant mounds in the skinned area of a baseball field.

and billbugs when it is applied in April into mid-May. It also can provide long-term control of turf-infesting caterpillars, but these are of little concern to sports turf managers.

Sport turf managers who can't afford new products like GrubGONE or Acelepryn should continue to consider the neonicotinoid insecticides. Most have gone off patent, and generic formulations of imidacloprid are quite inexpensive. Unfortunately, neonics have come under environmental scrutiny because of perceived bee toxicity issues. In most turf, bee toxicity shouldn't be an issue as flowering weeds are usually eliminated. However, there are many municipal fields where clover and dandelion are allowed to grow. In these cases, it is obvious that spray applications of imidacloprid, thiamethoxam or clothianidin can adversely affect honeybees and bumble bees that could forage on flowers that were also sprayed. There are two obvious solutions to this situation — use a granular insecticide, or eliminate the weeds before using the insecticide.

When using one of the neonics, the manager needs to determine what pests are present (white grubs, billbugs or both). If billbugs are the major problem, then apply any of these insecticides in the month of May in Ohio. If white grubs are the major problem, then apply any of the insecticides in June or July. Where both billbugs and white grubs are a risk, only clothianidin seems to have the staying power to be applied in May (kills the billbugs), and the residue will remain until late July into early August to kill the new crop of white grubs.

When it comes to controlling the turfgrass ant, *Lasius neoniger*, the new products haven't shown much promise. The traditional way to manage this ant was to make applications of a pyrethroid insecticide every two to three weeks during the warmer months of the season. Apparently, pyrethroids only kill foraging ants and cause them to close up their burrow openings until the residues disappear. Imidacloprid or clothianidin applications don't seem to cause much reduction in ant activity after their applications, but after five to six weeks, the ant mounds begin to disappear.

In the past, we used to recommend combination products (a pyrethroid plus the neonic), which stopped ant activity quickly and then seemed to eliminate the colonies. Pre-mixed combinations were available for some time, but now the combos are becoming difficult to find.

Even without the pre-mixes, there's no issue with making your own combination. It has been our experience that the combination of bifenthrin (Tempo™) plus clothianidin (Arena) stops ant activity and keeps them out for an entire season, perhaps longer. Bifenthrin plus imidacloprid also does this, but there may be a slight rebound of ant mound activity in the three to four weeks after the application, before the imidacloprid component finally takes out the colonies.

We have recently learned that a few municipalities are banning the use of all insecticides on municipal (including school) properties. Ouch! In these cases, I would recommend approaching the decision-makers to determine if GrubGONE would be exempt, since it is a microbial insecticide. The only other non-pesticide options are to use the insect parasitic nematodes (their use will require an entire article) or begin using endophytic turf-type tall fescues. The nematodes should be used only by managers who have contracted with a supplier to provide fresh nematodes at the time they are needed. The endophytic tall fescues stop billbugs, and their dense and more fibrous roots can tolerate twice the grubs that Kentucky bluegrass or ryegrass can handle!

OSU TURFGRASS SCIENCE TEAM

Horticulture & Crop Science

Dr. Karl Danneberger
danneberger.1@osu.edu
Dr. David Gardner
gardner.254@osu.edu
Dr. Ray Miller
miller.5@osu.edu
Dr. John Street
street.1@osu.edu
Ms. Pamela Sherratt
sherratt.1@osu.edu
Mr. Matt Williams
williams.1278@osu.edu

School of Natural Resources

Dr. Ed McCoy
mccoy.13@osu.edu

Entomology

Dr. Dave Shetlar
shetlar.1@osu.edu
Jennifer Andon
andon.1@osu.edu

Plant Pathology

Dr. Francesca Peduto Hand
pedutohand.1@osu.edu
Mr. Todd Hicks
hicks.19@osu.edu
Mr. Joseph Rimelspach
rimelspach.1@osu.edu

Ag. Tech. Institute

Dr. Daniel Voltz
voltz.5@osu.edu

Athletics

Mr. Dennis Bowsher
bowsher.33@osu.edu
Mr. Brian Gimbel
gimbel.1@osu.edu

International Programs

Mr. Mike O'Keeffe
okeeffe.1@osu.edu

CALENDAR OF EVENTS

December 7–10
Ohio Turfgrass Conference and Show
Greater Columbus Convention Center
Columbus, OH

BUCKS FOR TURF

Donate an item to the Bucks for Turf auction today to help us further our mission of providing resources for the turfgrass industry.

Visit **www.BucksForTurf.org** to donate!

ADVERTISER INDEX

Digital MARKETPLACE

grubGONE!® G

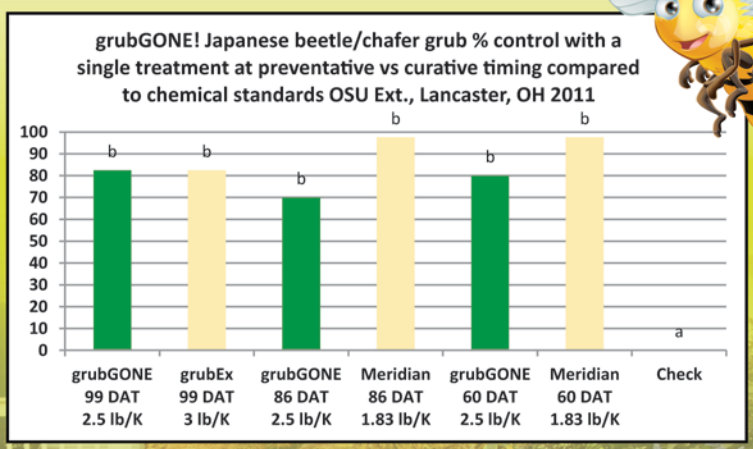
Target the Pest, Not the Rest!®

A New bio insecticide from Phyllom BioProducts Corp. that helps protect the quality and value of landscape and recreational turf grasses and ornamental plants with the novel active ingredient, Bacillus thuringiensis galleriae, (BTG). It is the first Bt insecticide powerful enough to be applied as a spreadable granule against 1st - 3rd instar grubs. Yet, grubGONE! demonstrated no adverse risks to non targets tested. grubGONE! is registered for use on all landscape and recreational turf grasses and ornamental plants.

grubGONE! benefits:

- Protects the value of turf landscapes and ornamental plants by effectively controlling susceptible beetle & weevil grubs in the season of application
- Application flexibility, apply as a preventative or curative treatment
- Helps manage resistance to chemistries with a new mode of action for IPM programs
- No label restrictions for bees or flowering plants
- grubGONE! and Bt insecticides help build a positive public image for your program
- Shelf life is greater than 2 years when stored as directed

Grubs controlled by grubGONE!	
Common Name	**Latin Name**
Japanese beetle	*Popillia japonica*
Oriental beetle	*Anomala orientalis*
Asiatic garden beetle	*Maladera Castenea*
European chafer	*Rhizotrogus majalis*
N. masked chafer	*C. borealis*
S. masked chafer	*C. lurida*
May/June beetle	*Phyllophaga spp.*
Green June beetle	*Cotinis nitida*
Annual bluegrass weevil	*Listronotus maculicollis*



Phyllom BioProducts Corp.
www.phyllombioproducts.com
info@phyllom.com
Tel. 650.322.5000

Phyllom BioProducts
Protecting Forests, Farms and Landscapes®