



# Don't Bug Me!

**B**ugs, or more properly, insects are just another part of the turf management challenge facing golf course superintendents. Just when we get the turfgrass lush and healthy the bugs move in for a feast. If they aren't watched carefully, they can turn a velvety-smooth putting green into a ragged, pock-marked embarrassment.

If there is a trend in insect control, it would be that more and more superintendents are applying chemicals less often and to smaller areas on the golf course. Superintendents, who once used to spray all 18 greens if any signs of insect activity were spotted, now spray only those greens where actual damage is seen. If there are concerns about additional infestations, soap flushes are used to bring potential turf gobblers to the surface to evaluate populations and make more intelligent spraying decisions.

The good news is that insects have pretty consistent and definite life cycles which can be monitored to avoid surprises. The bad news is that, thanks to the 1996 Food Quality Protection Act, some of our familiar weapons against the creepy-crawlies are becoming endangered or extinct. There's more good news in that manufacturers are coming up with new products that require lower doses, are less toxic and are highly effective. The down side is that they tend to be specific to one kind of insect and they are more expensive than the older products. The cost factor added to reduced broad-spectrum control has superintendents looking for new ways to combat insect pests.

The following articles will look at some strategies and products for keeping the bugs on your course under control. Other suggested references for insect control are the *2000 University of Florida Pest Control Guide for Turfgrass Managers* and *Best Management Practices for Florida Golf Courses*. Both publications are available from your county extension offices or by calling the UF/IFAS Publications office at 800-226-1764.

JOEL JACKSON, CGCS

## New Weapons for Old Enemies in Y2K

**E**ven in the new millennium, and the computer age continuing to give us new technology, it is still the same age-old problems with insects that our men-

tors faced. I would have to say that the "big three" are nematodes, mole crickets and grubs.

"Todes" are probably the most frustrating to all superintendents because of the difficulty in controlling them. The majority of control needs to be done in the spring (March and April) to allow

the grass to set roots and get healthy for the summer heat.

My application weapon of choice has been Toro's high-pressure injector, and spot treating using liquid NemaCur 3 at a rate of 3 gallons per acre, with good results. Critical to good application coverage is to make sure the swaths are close together to avoid a zebra-stripe look that will not "green up" like the treated areas. An added benefit of using the injector is that the product is applied directly into the soil and doesn't sit on the grass surface waiting to be watered in after the entire area is treated, which equates to less exposure.

When it comes to controlling "crickets," scouting and timing are everything! The IPM specialist must scout and map the areas that need to be treated. Adults that have over-wintered become active in the spring and one or two treatments are required immediately.

And right away we have to prepare for the nymphs. Monitoring the adults and the egg development is an ongoing process. When the eggs get hard and become a pearl color, it indicates that they are ready to be laid.

At that point, we begin treating with a long-term-residual product, such as Merit. What we are looking to do is create a generation gap in the life cycle of the crickets, and grub control. By reducing the number of nymphs that survive, then you reduce the amount of adults to deal with later. After nymphs are controlled, adult mole crickets and grub control can be reduced.

For instance, we spot treat, and alternate spraying between the front nine and the back nine, once a week, with Turcam or Orthene (depending on the target), on approximately 6 acres, for the rest of the summer. Our IPM specialist continually scouts and maps areas that need treating, reducing wasted time looking for problems while out on the spray rig, and can go right to the areas that need treating.

Our greens get foliar fed at least once a week, year round. We treat for worms on a preventive basis with Dipel during periods of pressure. The results are usually very effective, yet, when the rains are



coming everyday, the webworms become relentless in their egg-laying. It is then necessary to apply a quick knock-down product such as Conserve or Astro.

There is no doubt in my mind that when a pesticide is improperly used, it results in a negative impact on the environment. It never fails that when we experience a *naturally occurring* fish kill in one of our lakes — due to a low-dissolved oxygen problem caused by a warm, cloudy day with a rain shower (like that never happens in Florida) — a club member will ask if all of the chemicals I use killed the fish! I have seen a fish kill due to the application of a pesticide with the onset of an unexpected afternoon rain that washed the treatment into the water, but it is my opinion that a lot of the fish kills caused by pesticides are actually the misdiagnosis of the low dissolved oxygen in the water.

As far as any problems with humans, the only incident that I can recall of someone being affected by a pesticide

application was myself. I was exposed to a chemical that caused me to have a bad reaction, and believe me, it was a living hell. Just remember, believe what they say on the label about possible effects on humans.

Always keep in mind, too, any possible exposure to any human when applying materials, and take all of the recommended safety precautions. Having experienced it myself, I would not wish a reaction to exposure on anyone.

For the most part, I am enthusiastic about the low dose, highly effective types of new chemistry that is being introduced. I focus on using products that are safe to us and to the environment. I believe that chemical manufacturers recognize the fact that they must produce safe, environmentally friendly products for golf courses because superintendents have come to demand them.

I also believe that the FQPA could result in the loss of some of the safe chemicals out there due to lack of — or

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***One of the biggest problems with mole crickets is that you get disruption to the root system. The roots and soil dry out, and the ground is not as firm for mowers and people walking, because of all the mole cricket tunnels. Turf quality, in general, decreases.***

Chip Fowkes  
Frenchman's Creek Golf Course.  
Photo by Kenny Brooks.

misrepresentation of — the truth, plus some hard-nosed science. Hopefully, golf courses will not suffer too much, and that new, improved products will continue to be developed for our use.

Keep in mind, however, that it takes approximately 10 years in research and \$50 million to bring a new product to market. It is a lengthy and costly process, and I, for one, am glad that manufacturers are keeping up with the advances in new science and technology.

BILLY DAVIDSON, GCS  
Colliers Reserve

## Stewards Beware: Mole Crickets Afoot

Say the words “mole cricket” to any superintendent in the Southeast, and you’ll likely see him flinch, grimace or simply shake his head. That’s because most superintendents in the region have either experienced the devastation and frustration of mole crick-

ets firsthand or know of another superintendent who’s been plagued by them.

Mole crickets arrived in Georgia and Florida from southern South America in about 1900.

Currently there are 10 mole cricket species in the United States, but the three major species inflicting the most damage in the South are the tawny mole cricket (*Scapteriscus vicinus*), southern mole cricket (*Scapteriscus borellii*) and short-winged mole cricket (*Scapteriscus abbreviatus*).

The tawny and southern mole crickets reside primarily in the lowlands of Florida, Georgia, Alabama, Mississippi, Louisiana, North and South Carolina; however, there have been reports of the southern mole cricket as far west as Arizona and California. The short-winged mole cricket resides mainly in Florida.

### Overstaying Their Welcome

Since their introduction into the

United States, mole crickets have done nothing but wreak havoc on turfgrass and turf soil.

In fact, some have compared the mole cricket to house guests who overstay their welcome — and unfortunately for superintendents, these guests won’t leave without a fight.

“Mole crickets caused complete devastation in parts of fairways on both of the Boca Woods courses,” says John Gallagher, Boca Woods Country Club superintendent in Boca Raton.

“The way I understand it, the crickets were here before the golf course was. This area used to be a dairy farm. From the moment the course was completed, we spent all summer trying to control crickets. Damage was everywhere.”

The damage mole crickets cause to both turf roots and soil with their feeding and tunneling can be devastating. They feed voraciously on roots, stems and ground-level plant leaves. One mole cricket may tunnel and feed several yards each night.

They also disrupt the soil by tunneling underground, loosening the soil and uprooting turf.

The tunneling destroys roots and causes the soil to dry out, placing added stress upon plants. Not to mention, tunnels located just below the ground surface cause soil to bulge above the surface.

The raised tunnels spoil the smooth surface of the greens, affect play and can be hit by mowers or other maintenance equipment.

“One of the biggest problems with mole crickets is that you get disruption to the root system,” says Chip Fowkes, superintendent at Frenchmen’s Creek in Palm Beach Gardens. “The roots and soil dry out, and the ground is not as firm for mowers and people walking, because of all the mole cricket tunnels. Turf quality, in general, decreases.”

### Biological Controls

Since mole crickets have no native insect parasites in the United States, scientists have researched what insects





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*John Gallagher  
Boca Woods C.C.  
Photo by Kenny Brooks.*

### **Chemical Controls**

Superintendents have tried most of the chemical control products available in an attempt to control or slow down mole cricket populations. Common mole cricket controls include:

- Acephate - Orthene TTO, OTTO 97 and Pinpoint
- Bendiocarb - Turcam
- Bifenthrin - Talstar
- Chlorpyrifos - Dursban
- Deltamethrin - DeltaGard
- Ethoprop - Mocap
- Fipronil - Chipco Choice
- Imidacloprid -
- Lambda-cyhalothrin - Scimitar

Using strategic combinations of these products has proven to limit populations, at least on a temporary basis.

"I've used Orthene, Oftanol, Mocap, Turcam and the list goes on," says Gallagher. "We've gotten some good results out of all of them, but it was limited because the mole crickets are not surface feeders.

"It all depends on timing. If the crickets are near the top, we get contact. Those down deep are not affected."

Mole crickets are so difficult to control that the only product Gallagher feels he's had success with is fipronil — available as CHIPCO® CHOICE™ brand insecticide.

"After we applied CHIPCO CHOICE for the first time, we expected to have to go back in and spot-treat, as we have with past products," says Gallagher. "What I noticed was that there wasn't any mole cricket activity — the fairways were clean."

CHIPCO® CHOICE™ has become the standard in mole cricket control since its registration four years ago. With its consistency, residual control and flexible application window, the product dominates the mole cricket control market.

While some superintendents do rotate with other chemistries such as bendiocarb and acephate, they usually have to come back with spot treatments throughout the summer season.

### **Timing is the Key**

are available from the mole cricket's native continent of South America. Currently, they have experimented with two such pests — the Brazilian red-eyed fly (*Ormia depleta*) and the Steinernema nematode.

The red-eyed fly is a natural enemy of the tawny and southern mole crickets. Adult flies lay eggs on mole crickets.

After hatching, the larvae eat the mole crickets. However, because the red-eyed fly is accustomed to the warm, humid, subtropical climate of Brazil, it is unlikely that it will spread anywhere outside of Florida.

Nematodes, the other biological control, can be applied with spray equipment. The nematode waits in the soil until a mole cricket tunnels by, it then crawls inside the cricket's mouth or breathing tubes

It then releases bacteria that kills the crickets. The nematodes feed on that bacteria, reproduce and the cycle begins again. Nematodes eat the adult mole crickets in the spring before they lay their eggs or in the fall when larvae have matured to adults.

Both of these methods are still being researched. Neither the red-eyed fly nor nematode eliminates mole cricket problems. One difficulty of using the parasites (red-eyed fly, nematode) as a sole control option is that when the host mole cricket population is reduced, the parasite population also declines.

The red-eyed fly and nematode will not naturally regenerate later to populations necessary for control. As a result, the parasites serve to help keep populations in check, not as a complete control option.





Whether it is biological or chemical, the key to effective pest control is timing. The best control is achieved when the eggs have just hatched and the mole crickets are most vulnerable. Larger nymphs and adult mole crickets, on the other hand, are increasingly more difficult to control.

As a result, closely monitoring the lifecycle of mole crickets is necessary. In general, hatching occurs around the end of May to the first of June, depending on the season's temperatures.

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*KERRY BROOKS  
Gibbs & Soell, Inc.  
For Aventis, Inc.*

## Mole Cricket Scouting Program

**Editor's note:** *This article is about a program developed specifically for the Bayer Corporation by Dr. Pat Cobb, professor emeritus from Auburn University, for the timing of MERIT™ insecticide applications for the control mole crickets and white grubs. This article is presented because the concepts and methods for determining the mole cricket egg hatch will determine the window of opportunity for optimum insect control regardless of the product used.*

**M**ERIT Insecticide is a broad-spectrum systemic insecticide that is effective at low-use rates with properly timed application against mole crickets. It is available in several formulations (MERIT 75 WSP, MERIT 75 WP and MERIT 0.5 G).

Merit Insecticide also offers value-added insect control for the white grub complex, while providing control of mole crickets. It is common for both

pests to cause damage in the same stand of turf. With one properly timed, self-applied application per year, this two-in-one control is a smart value and time-saver compared to making two separate applications.

MERIT provided the best results when properly timed. Scouting for adult mole cricket activity is the first step for determining optimal Merit application timing.

### Scouting Instructions

Begin by looking for active mole cricket tunnel damage, especially on

sunny southern slopes, tee boxes or areas damaged the previous year. Using a soap flush mixture of 1 to 2 tablespoons of lemon-scented liquid detergent in 1 gallon of water, flush active mole crickets to collect adults. Try to avoid overmixing. If the soap solution is too foamy, it can be difficult to detect the mole crickets.

The best time to flush is during the early morning or late afternoon. Pour approximately 1 quart of soapy water per square foot over fresh active tunnels. Multiple locations in a 20-foot area can be flushed at the same time. Marking with a flag makes a good reference to

## Product Clarification – Less Is More

May 22, 2000

To: All Florida golf course superintendents, distributor reps and other end users of ORTHENE™ Turf Tree & Ornamental Spray (75% Powder and/or New 97 Pellet)

From: Peter Blum, Technical Sales Rep., Professional Products Group, Valent U.S.A. Corporation

I would like to clarify a few issues that several superintendents have raised regarding ORTHENE Turf, Tree & Ornamental Spray (75% powder) vs. our new formulation, ORTHENE Turf, Tree & Ornamental Spray 97.

The new OTTO 97 is a 97% pure, high-grade pelletized product and is a totally dust-free, low-odor formulation. This new generation of ORTHENE addresses worker exposure issues - issues the industry remains concerned with on all products being sold in a dusty, powder formulation.

The new OTTO 97 is packaged in a .773 lb. can and a 7.73 lb. plastic resealable zipper-lock bag. These package sizes are equivalent in active ingredient to our 1 lb. and 10 lb. OTTO 75, respectively.

In other words, 1 lb. of OTTO 75 is equal to .773 lb. of OTTO 97. Furthermore, the price of OTTO 97 in a .773 lb. can is the same as the price of the 1 lb. OTTO 75. And the price of OTTO 97 in the 7.73 lb. bag is the same as 10 pounds of our OTTO 75. Thus, OTTO 97 will be the same cost per 100 gallons of tank mix or per acre as the OTTO 75. It simply takes less of the OTTO 97 to do the job as it is almost 25% stronger.

Distributors have the option of pricing OTTO 97 to the users on a per pound basis or on a per unit basis. If they price the OTTO 97 on a per pound basis, the cost per pound will be higher than a pound of OTTO 75. But if they price OTTO 97 on a per unit basis by container size (.773 lb. or 7.773 lb) vs. OTTO 75 (1 lb. or 10 lbs.), they should be of equal value.

One last point: The new OTTO 97 is available only under the product brand name ORTHENE Turf, Tree & Ornamental Spray 97 by Valent U.S.A. Corp.

I hope this addresses the questions you have had regarding these issues. Valent U.S.A. appreciates your business and your interest in our products. If I can be of further service, feel free to contact me. Thank you.

Sincerely,  
Peter Blum  
Valent U.S.A. Corp.  
Boca Raton, FL  
(561) 995-9603





***The best time to flush is during the early morning or***

***late afternoon. Pour approximately 1 quart of soapy***

***water per square foot over fresh active tunnels.***

***Multiple locations in a 20-foot area can be flushed at***

***the same time. Marking with a flag makes a good***

***reference to locate the flushed spot.***

locate the flushed spot. Sometimes under dry conditions, an extra soap flush may be needed after the first has soaked in. Adult mole crickets may not surface for several minutes (5 to 10 minutes). Occasionally, tender foliage may be susceptible to slight burn from the soap under hot conditions.

Peak-season mole cricket activity varies depending on location and temperatures. Determine and record the identification of the mole crickets with each collection. Save collected specimens in labeled 4-ounce jelly jars half-filled with alcohol for future reference to predict egg hatch. Make sure all specimens are dated.

#### **Mole cricket sex identification**

You will need to be able to identify the female mole cricket in order to examine their eggs to predict egg hatch. The easiest way to determine the sex of mole crickets is to examine the wing area of the adults.

Adult tawny and southern mole crickets have wings that overlap and are the length of the abdomen. Hold the specimen so the wings are visible. Observe just behind the head at the base of the wings. The male will have a raised triangle that looks V-shape at the base of the wings. The female mole cricket will not have the darker raised area at the base of the wings and is lighter in color. This can be confirmed by rubbing a fingernail over the area at the base of the wings.

#### **Mole cricket egg development and early hatch**

Once you have identified the female mole crickets, you can examine their eggs to predict egg-lay and hatch.

Peel open the abdomen and locate the oval-shaped eggs behind the internal organs. In general, if eggs are small (pinhead size), light in color, flat or very soft to the touch, the female is in the early stages of egg development. In the later stages of egg development, the eggs become larger and more oval but remain soft and light in color — she may lay eggs within a few weeks. However, if the eggs are firm, and sometimes darker in color, egg lay can be expected within five days and hatch should begin in two weeks.

If you do not find eggs, the females may have already laid their eggs, and you should begin to monitoring for hatch. Start by soap flushing and observing for small nymphs (1 centimeter in size). These come to the top of the grass within a few minutes of soap flush. Small nymphs can be difficult to detect, so pay careful attention. Look closely for movement, because it is easier to see and collect small nymphs that are moving. You may notice nymphs when flushing for adult mole crickets. If your soap solution has too much foam, you may miss some nymphs.

Keeping records on species, numbers, sex and stage of development will provide useful information for MERIT ap-

plication timing. Record the size of nymphs collected if the program is initiated after egg-lay.

#### **MERIT application timing**

If the majority of females are in early stages of egg development, wait a week and scout again. If the majority are in the later stages of egg development, application time is near. Scout this area once or twice a week for small nymphs. If very small nymphs are found during flush, apply MERIT within seven to ten days. If larger nymphs (1 centimeter) are found, apply MERIT at first opportunity. Do not wait longer than one week.

#### **Irrigation**

Adequate irrigation or rainfall is needed after application to move MERIT into the soil. Apply sufficient irrigation to wet soil a minimum of 1 inch deep. For optimum control, irrigation or rainfall should occur the evening of application and before mowing.

#### **Summary**

- MERIT effectively controls mole crickets and the white grub complex with only one preventative application each season. This two-in-one approach is economical and a time saver.
- MERIT provides the option of self-application or custom-application.
- Proper timing is critical to achieve the best results with MERIT. Scouting for adult mole cricket activity is the best way to determine proper timing.
- Mole cricket egg-lay can be predicted by observing eggs in the female's abdomen. If eggs are firm, hard and sometimes dark in color, egg-lay can be expected within five days.
- Male mole crickets have a dark, raised v-shaped at the base of their wings, females don't.
- MERIT is most effective when timed with the first hatch of mole crickets.

*PAT COBB, PH.D.*

*Entomology Professor Emeritus  
Auburn University*