

SEPTEMBER/OCTOBER 2016

Using Neonicotinoids in the Landscape | Olive Trees

**Termite Product
Evaluations**

PESTPRO

From University of Florida Entomology to Landscape and Pest Managers

Zika Update

Rodenticides



NONPROFIT ORG
US POSTAGE
PAID
GAINESVILLE FL
PERMIT NO. 94

University of Florida
PO 110620
GAINESVILLE, FL 32611-0620



Taurus[®] Trio G

with **Combination Chemistry[®]**

three active ingredients: **fipronil**,
bifenthrin and **lambda cyhalothrin**
for unbeatable fire ant control



VISIT CSI AT BOOTH # 641 AT

PESTWORLD 2016

IN SEATTLE, WA - OCTOBER 18-21



Taurus[®] Trio G from Controls Solutions, combines three different active ingredients in one uniform granule to deliver fast and long-lasting fire ant control. Two unique modes of action and a superior Verge[®] Technology Granule ensure uniform coverage as well as dust-free treatments for residential lawns, recreational areas, commercial and industrial landscapes.



ADAMA

Consumer &
Professional
Solutions

**Control
Solutions Inc.**

Innovation you can apply.

www.controlsolutionsinc.com
www.adama.com

[www.controlsolutionsinc.com/
products/taurus-trio-g](http://www.controlsolutionsinc.com/products/taurus-trio-g)

Contact your local distributor or CSI representative for more information. This product may not be registered in all states; please check the CSI website or the state's department of agriculture for registration information. Taurus and Combination Chemistry are registered trademarks of Control Solutions Inc.

Find us on



PESTPRO

magazine is a publication of

Pest Management Education, Inc.

5814 Nob Hill Blvd.
Port Orange, FL 32127

A nonprofit corporation working to help
UF Urban Entomology. Technical information
provided by the University of Florida.

Board of Directors

Lisa Ashley, Fusion Communications
Tim Brock, Brock Lawn & Pest Control
John Cooksey, McCall Service
Dr. Phil Koehler, University of Florida
Marie Knox, Control Solutions, Inc.
Jane Medley, University of Florida
John Paige III, Bayer
Dr. Roberto Pereira, University of Florida
Dr. Clay Scherer, Syngenta

Managing Director

Philip Koehler (352) 392-2484
pgk@ufl.edu

Managing Editor

Roberto Pereira (352) 392-2485
rpereira@ufl.edu

Production Editor

Jane Medley (352) 871-1809
medleyuf@gmail.com

Advertising Manager

Sandra Krempasky (904) 679-5615
ads@pestpromagazine.com

PESTPRO (ISSN 1553-4693) is published Jan.–Feb.,
March–April, May–June, July–Aug., Sept.–Oct., and
Nov.–Dec. by:

Pest Management Education, Inc.
5814 Nob Hill Blvd.
Port Orange, Florida 32127
Phone (352) 392-2326

Copyright © 2016 by the University of Florida
and Pest Management Education, Inc.

POSTMASTER: Send address changes to:

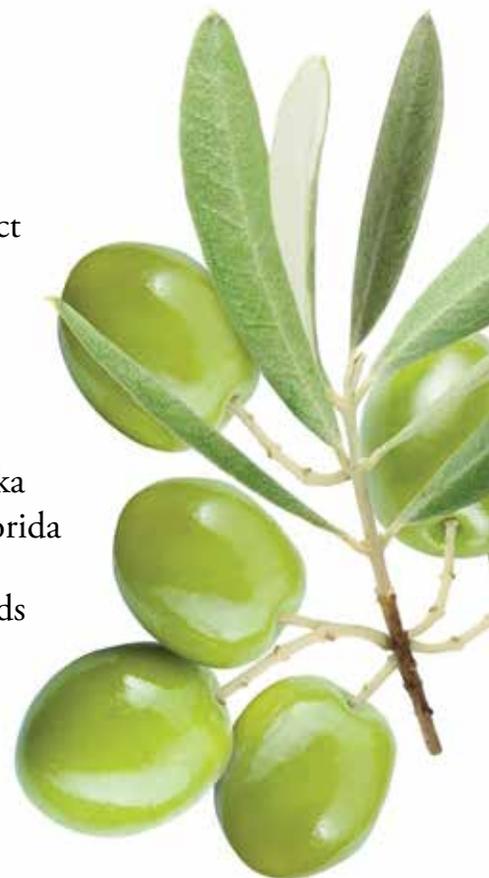
Pest Management Education, Inc.
5814 Nob Hill Blvd.
Port Orange, FL 32127

FOR ADVERTISING information contact our
advertising manager, Sandra Krempasky, at (904) 679-
5615, or by email at ads@pestpromagazine.com.

CONTENTS

FEATURES

- 8** Rodenticides
For Pest Control
- 11** New Termite Product
Evaluations
- 16** Student Profile:
Heather Erskine
- 19** Update on Local Zika
Transmissions in Florida
- 23** Using Neonicotinoids
In the Landscape



DEPARTMENTS

- 7 Editorial:** What's New in Education?
- 15 Pest Detective:** Nematodes
- 22 Executive Suite:** Why You Should Seriously
Consider Selling Your Company *Now*, Part II
- 25 L&O News:** Olive Trees are Coming!
- 27 PCO Pointer:** Termite Control Contracts



ON THE COVER

Rodents in the home can cause damage and spread potentially fatal diseases. Learn to use rodenticides safely and effectively to rid your customers of pesky rats and mice. Vertebrate pest expert Bill Kern tells you how.

House mouse photo by Lukas Blazek



NUVAN
PROSTRIPS®

The end for bed bugs and other pests.

Nuvan® Prostrips® unique vapor action gets into tight places that other products can't, killing bedbugs and other insects in their tracks. Send pests to their maker and vaporize them with Nuvan Prostrips.

For more information about Nuvan Prostrips contact your local AMVAC distributor, call 1-888 GO AMVAC (1-888-462-6822) or visit www.amvac-chemical.com.

 **AMVAC**

Always read and follow all label directions. Nuvan® and Prostrips® are registered trademarks of AMVAC Chemical Corporation. ©2013 AMVAC Chemical Corporation.

Don't let fleas come between friends

*Kill fleas and prevent
infestations for a full season*

PT Alpine

Flea & Bed Bug
Pressurized Insecticide

BASF

We create chemistry

Protect your customers with **PT Alpine** flea and bed bug pressurized insecticide. Quick and easy to apply, it kills fleas for up to 30 days and hatching flea eggs for up to seven months. This powerful insecticide delivers excellent value, covering 2,625 square feet per can.

For more information, contact Brian DeChirico (Northern Florida) brian.dechirico@basf.com or Herman Giraldo (Southern Florida) herman.giraldo@basf.com

Always read and follow label directions. Do not treat pets with this product.
Alpine and PT are registered trademarks of BASF. © 2016 BASF Corporation. All rights reserved.



'Instar Wars – Episode II'

The University of Florida's
1st Annual Southwest Florida Pest Management Conference

October 7, 2016

Florida SouthWestern State College

Lee Campus in Ft. Myers, Florida

Classroom 'U' Building, Multipurpose Room U-102

What's New in Education:

SW Florida Pest Management Conference, Oct. 7, 2016

PESTPRO magazine and the SE Pest Management Conference are two ways we at the University of Florida provide education to the pest management industry in Florida. This year we decided to significantly expand our educational efforts by organizing and presenting the "Southwest Florida Pest Management Conference" in Ft. Myers. It will be a one-day meeting on October 7 at Florida SouthWestern State College in their Classroom "U" building. The meeting will be a University of Florida event held specifically for the Southwest Florida pest management industry — the first in many years. Stephen Brown of Lee County Cooperative Extension is cooperating in offering this program. There will be FREE registration for all attendees, so we expect a big turnout.

The conference will be split into Classroom and Field Day sessions that will provide two hours of CEUs in L&O, GHP, WDO, and Core. The classroom presentations will be for CEUs for certified operators. The field day portion will provide hands-on training for both technicians and certified operators (Core CEUs).

Years ago, many programs were held in Lee County for the pest management industry. There was great support among the companies for these educational efforts. Disappointingly, there have been few recent events offered other than those made available by industry distributors and manufacturers. Because the SE Pest Management Conference in Gainesville is difficult for some in the industry to attend, we wanted to produce a one-day conference for the vibrant industry in Ft. Myers, Naples, Port Charlotte, and Sarasota, as well as other communities in southwest Florida.

We found out that, unfortunately, the meeting facility at Lee County Cooperative Extension Office was closed permanently and not available for meetings. After searching for a suitable location, we discovered that Florida SouthWestern State College had really beautiful facilities that would be available to us. I had not heard of Florida SouthWestern State College before. But I soon found out its history.

Florida SouthWestern State College used to be called Edison Community College, and we have done presentations there in the past. The first students were admitted to then-Edison Junior College in the fall of 1962, and the college continues to provide students with the opportunity to fulfill their professional goals. In July 2014, the college was renamed Florida

SouthWestern State College (FSW). The college offers Associate in Arts, Associate in Science, and Baccalaureate degrees, as well as various certificate programs. The Lee County Campus was renamed the Thomas Edison Campus in 2014 and has 24 permanent structures, including the "U" Classroom building, where the Southwest Florida Pest Management Conference will be held.

The program will start at 9:30 AM on October 7. Dr. Adam Dale will be presenting new information about lawn and landscape insect management. Dr. Dale is our new turf and ornamental entomologist at the University of Florida. He got his PhD at North Carolina State University and joined our faculty in January. At 9:40 AM Stephen Brown, the Extension Horticulture Agent for Lee County, will do a presentation on treatment options and techniques for palms in South Florida. At 10:50 AM Dr. Roberto Pereira will be presenting the new *Wood-Destroying Organisms Applicator Training Manual*. The new manual has just been released and is now available to the industry.

At 1:15 PM, Dr. Thomas Chouvenec of the Ft. Lauderdale Research Center will be talking about hybrid termites. The hybrid termites have been called super termites by the press. He will be covering his experience with discovering these pests, which result from crossbred Formosan and Asian termites. At 2:25 PM Dr. Phil Koehler will be presenting on mosquitoes, Zika, and the pest control industry. Due to Zika being transmitted by mosquitoes in Florida, it is important for the industry to be prepared to solve customer concerns. At 3:35 PM the graduate students from the Urban Entomology Lab will be presenting their research on cockroaches, ants and bed bugs.

The field day is a chance to learn by hands-on training. At 8:30 AM, technicians and certified operators will be dealing with pesticide spills. Personnel from FDACS will go through the equipment needed and the steps required to handle an accidental pesticide spill. At 9:40 AM, Dr. Ben Hottel of Florida A&M University will demonstrate the proper use and application of baits and pyrethroid insecticides. Dr. Hottel is a former student of Dr. Koehler's and was recently hired as an assistant professor at Florida A&M.

The field day will end with experts from FDACS presenting the process of vehicle inspections and violations. You will not want

to miss the SW Florida Pest Management Conference!

SOMETHING ELSE we have been working on is the new *Wood-Destroying Organisms Applicator Training Manual*. The 204-page manual is now complete. It will provide the study material for the WDO exam for certified pest control operators. We have been writing and editing the manual for the past year. We are really pleased to have finally finished this long-needed book.

It is amazing to me that there has never been a comprehensive manual on wood destroying organisms for Florida. I even looked at other states' educational materials and could not find a comprehensive guide that was prepared elsewhere.

The manual has 14 chapters. The first is an introduction to WDOs and non-WDOs, with lists of what Florida considers a WDO and what is not a WDO. The introduction also has keys to the damage and beetles, as well as beetles that are not reportable as WDOs on FDACS form 13645. Chapters 2 through 5 are about termites, beetles, fungi, and other WDO-like organisms.

Chapter 6 is on foundations, framing, and building terminology, including a house building schedule with the proper placement of soil, bait, and wood treatments for WDOs. The WDO-protection parts of the building code are also presented. Chapter 7 presents the process and requirements of building inspection for WDOs. Chapter 8 is on WDO treatments including soil, baits, and wood treatment directions and procedures. Chapters 9–11 are on termiticides and the environment, application equipment and calibration, and calculations of correct application amounts.

Finally, chapters 12–14 are on reading and interpreting the label, Statute 482 and Rule 5E-14, and contract requirements in law and rule. The manual (SM-80) will be sold in the UF/IFAS bookstore online, and the students plan to sell the manual at pest control meetings.

We have been really busy during the past few months developing helpful educational materials for the industry. You need to take advantage of your new educational opportunities. Attend the SW Florida Pest Management Conference on October 7, and make sure you get a copy of the new manual. **PP**

— Dr. Philip Koehler,
Managing Director

Rodenticides

William H. Kern, Jr.



Examples of rodenticide bait formulations

Pellets, grain, and meal-based baits are of limited use due to requirements that baits should not be able to be shaken out of bait stations.



extruded blocks



extruded pellets



parafinized blocks



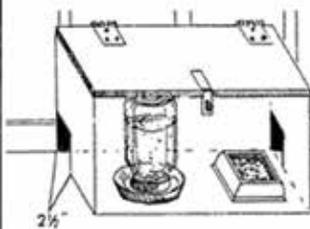
soft bait



grain based bait



meal based bait



Examples of liquid baits and baiting devices

It is always a good idea and usually a legal requirement to secure the liquid bait dispenser inside a tamper-resistant bait station.

Rodenticide tracking powders

are applied with small-volume hand dusters to confined areas like outdoor rodent burrows. Never apply rodenticide tracking powder with a power duster! Never apply it in areas that people may enter, like attics, drop ceilings, utility service spaces, and crawlspaces.



COMMENSAL RODENT CONTROL is one of the major activities of commercial pest control and is also important in homeowner DIY pest control. Even before the origin of the pest control service industry, people used rodenticides —poisons to kill pest rodents.

History of Rodenticides

The earliest rodenticides were toxic mineral salts or botanical toxins. The mineral salts included arsenic (arsenic trioxide or sodium arsenate), barium carbonate, cyanide (sodium cyanide or calcium cyanide), phosphorus paste, zinc phosphide, and thallium sulfate. The botanicals included materials like the alkaloid strychnine or its salt strychnine sulfate and the cardiac glycoside, scilliroside (Red Squill). With the rapid development of chemistry during the industrial revolution and the World wars, even more toxic compounds became available, like compounds 1080 (sodium fluoroacetate or sodium monofluoroacetate) and 1081 (fluoracetamide). The problem was that these were very toxic to people, pets, livestock and wildlife as well.

The origin and rise of the anticoagulants began with the development of warfarin (a hydroxy coumarin) in 1944 and released in 1950 by Wisconsin Alumni Research Foundation. Then came the development of the indandiones: pindone (Pival, Pivalyn, Contrax-P), diphacinone (Diphacin, Remik, Contrax-D), and chlorphacinone (Rozol). The marketing difficulty with the first generation multidose anticoagulants was that they were much slower acting than earlier acute poisons. It took several days of feeding to cause death, which meant it was much less likely to cause accidental poisoning of pets or people.

So how do you get people to use a product that is much safer, but is much slower acting? A clever salesman says, “This product causes the rodents to bleed internally, so they leave the house to find water and die outside.” It sounds plausible, but there is no evidence it occurs. It has however entered into pest control folklore.

Formulations of Rodenticides

Bait formulations are the most widely used formulation of rodenticides and the only one most people are aware of. Most baits are food based, but there are liquid baits that are particularly useful in food-rich and water-poor environments. There are three essential components to a good bait: 1) a highly palatable bait matrix (the attractive food part), 2) a nonrepellent toxicant (it won't work if they won't eat it), 3) a slow-acting toxicant or active ingredient (you don't want them getting ill at the first taste).

Tracking powders are restricted-use pesticides (RUP) that contain a highly concentrated active ingredient (toxicant) in a nonbait carrier, usually a clay-based dust. They are used only in restricted locations that are inaccessible to people, pets and wildlife, such as burrows under foundations or sidewalks. They should never be used in an occupied structure. The active ingredient is so concentrated that it can cause lung hemorrhages if any powder is accidentally

inhaled. For this reason, it is the most restricted form of rodenticide.

The fumigants are the final class of rodenticides. These are used to control rodents in commodities and for immediate cleanout of a structural infestation. The currently used fumigants include the cylinder-compressed gases sulfuryl fluoride, methyl bromide (Quarantine only), and hydrogen phosphide (phosphine gas). Phosphine gas can also be produced by the solid metallic phosphides, aluminum and magnesium phosphide. These products may be used only by licensed fumigators. All are restricted-use pesticides. Therefore, they will not be discussed further here.

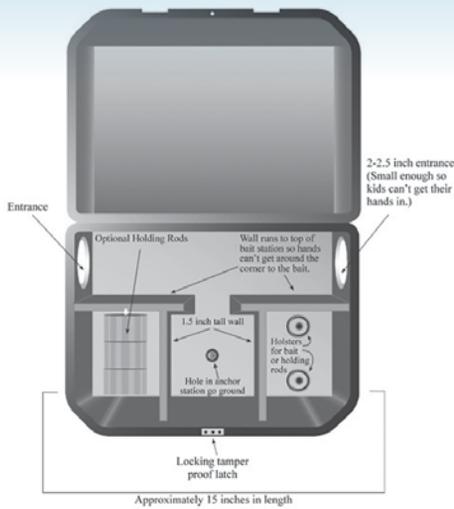
Rodenticide Active Ingredients

The list of active ingredients for rodenticide baits is pretty limited. Table 1 below describes the active ingredients used in rodenticide baits and tracking powders available to pest control operators and agricultural applicators. *Continued*

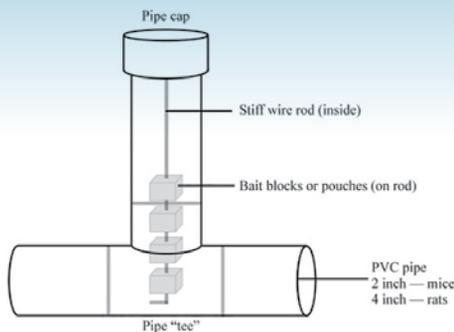
Active ingredient	Mode of action	Special Concerns	Antidote
Diphacinone	Multidose anticoagulant	Secondary poisoning Increasing resistance	Vitamin K
Chlorophacinone	Multidose anticoagulant	Secondary poisoning	Vitamin K
Brodifacoum	Single dose anticoagulant	Secondary poisoning EPA access restricted	Vitamin K
Bromadiolone	Single dose anticoagulant	Secondary poisoning EPA access restricted	Vitamin K
Difethialone	Single dose Anti-vitamin K anticoagulant	Secondary poisoning EPA access restricted	Vitamin K
Difenacoum	Single dose anticoagulant	Secondary poisoning EPA access restricted	Vitamin K
Bromethalin	Metabolic poison disrupts oxidative phosphorylation in the ATP cycle.	Reduced secondary toxicity because rodents stop feeding then die 2-3 days later.	None
Cholcalciferol (vitamin D ₃)	Mobilizes calcium, causing hypercalcemia.	No secondary toxicity. Death 3-4 days after lethal dose ingested.	Cacition
Zinc Phosphide	Produces phosphine gas in presence of weak stomach acid.	No secondary toxicity. Restricted Use Pesticide. Most common agricultural rodenticide.	None

Table 1. The active ingredients highlighted in yellow are not available to the general homeowner following the 2011 deadline for the 2008 EPA Risk Mitigation Decision for Ten Rodenticides.





Generic design characteristics for a tamper-resistant bait station ¹.



An inverted "T" bait station. Commercial and homemade versions can be secured with screws, nails, wire, or locking cable ties to stable items such as rebar stakes, fence posts, stringer boards of wooden fences, rafters, beams, pipes, or conduit ².



Tools for securing bait stations: Wire, zip ties, U-bolts, chains, cable wire, duckbill anchors, steel rods with cotter pins, concrete screws and washers, wood screws and washers, construction adhesive.



Some commercial bait stations are weighted or use strong magnets to secure them in place.



Securing the bait station is required to make it tamper resistant. Every operator likely has a preferred method of securing a station. Station manufacturers supply numerous devices to meet most situation. No device or technique works in all situations. For that reason, have several devices or techniques in your toolbox.

Rules of Rodenticide Bait Safety

- Always keep rodenticides secured when not in use. This means locked up!
- Place baits in areas away from children, pets, livestock and wildlife or in tamper-resistant bait stations. Any placement outside of a structure is accessible to wildlife and, therefore, must be inside a secured, tamper-resistant bait station.
- Baits can be secured inside the station by making the station immovable (secured to a solid surface like a slab or wall), or by securing the bait blocks or soft baits inside the station with rods so that they can't be shaken out. The station should still be secured so it can't be moved or removed.
- Tamper-resistant means that the bait cannot be removed or shaken out by a dog or a six-year-old child.
- Bait stations used outside must be within 50 feet of a man-made structure. A dumpster is considered a structure, but a fence is not. There are no restrictions on location of trap stations.

The following highlighted paragraphs are an excerpt quoted from the EPA Rodent Control Pesticide Safety Review, with explanations from the author in parentheses ³.

"To minimize the possibility of children and pets being exposed to mouse and rat poisons, we (the EPA) require (that manufacturers follow the following guidelines for consumer products:

- Be sold with bait stations that securely contain the poison.
- More protective bait stations that offer resistant to tampering by children, pets, and/or to weathering are available and required for applications made around children, pets, or outdoors.
- Contain the block or paste poison bait (loose bait forms are no longer permitted in consumer products).

Rodenticide manufacturers may no longer sell consumer products:

- With more than one pound of poison (formulated bait).
- Containing (any of the) four pesticides that pose the greatest risk to non-target wildlife (called second generation anticoagulants — brodifacoum, bromadiolone, difenacoum, and difethialone).
- Baits containing these poisons may still be used in (and around) homes by pest control professionals.

Nontarget wildlife and pets can be poisoned if they eat rodent baits, as can predators or scavengers that consume rodents that have eaten certain poisons."

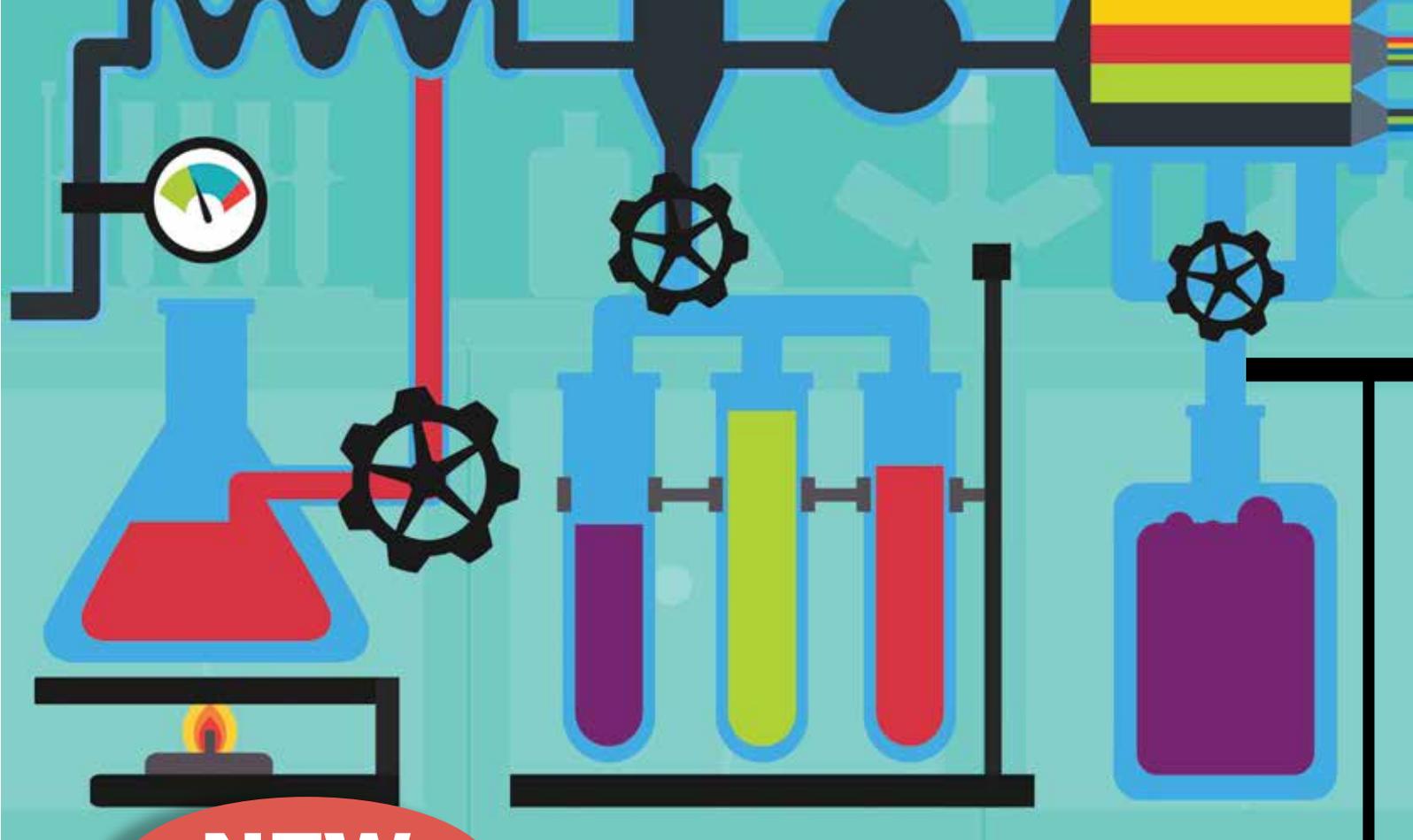
Take-home Messages

- Rodenticides should not be the first choice for control of rodent infestations in occupied structures.
- This tool is best used to deal with large or inaccessible infestations.
- Poisoned rodents don't leave the house to look for water. They feel sick, so they go to their nest to die. Expect and be prepared to deal with odor, maggot and fly problems.
- All rodenticide baits used outside must be inside a secured, tamper-resistant bait station.
- Secondary and accidental poisoning of wildlife and pets should always be a consideration when using rodenticides.
- Never use rodenticide tracking powders inside an occupied structure.
- Be aware that there are rodenticides sold on the internet that may not be legal to use in your particular state. You can check products for your state at the National Pesticide Information Retrieval System website at <http://state.ceris.purdue.edu/>. **PP**

¹ Drawing from <http://extensionpublications.unl.edu/assets/html/g1646/build/g1646.htm>

² Drawing from <http://extensionpublications.unl.edu/assets/html/g1646/build/g1646.htm>

³ <https://www.epa.gov/rodenticides/rodent-control-pesticide-safety-review>



NEW

Termite Product EVALUATIONS

Roberto M. Pereira and Philip G. Koehler

WHEN A new pest management product arrives on the market, we do not usually think about the long, tortuous path it took, from a few molecules in a laboratory beaker somewhere in the world to a specific dose applied to control a pest.

THE MILLIONS OF DOLLARS invested by the manufacturer and the countless hours from dedicated scientists and technicians are boiled down to a few ounces of product added to a number of gallons of tank mix, then applied following a recommended technique. But how exactly do we get there?

At the University of Florida Urban Entomology Laboratory, we have

participated in different phases of product development and testing. It is always exciting to see something we tested a few years back finally getting a commercial label and being used to resolve pest problems.

In the case of termite products, there are always certain criteria and procedures that need to be followed. We generally do not get involved in the very early phase of product development. This is usually handled by the pesticide manufacturing companies many years before any product is tested in our laboratory. A chemical that is finally developed into a pest management product usually starts as an interesting molecule that is studied in various basic aspects. It goes through rigorous testing before it finally sees the light of day outside the original laboratory, formulated into a test product.

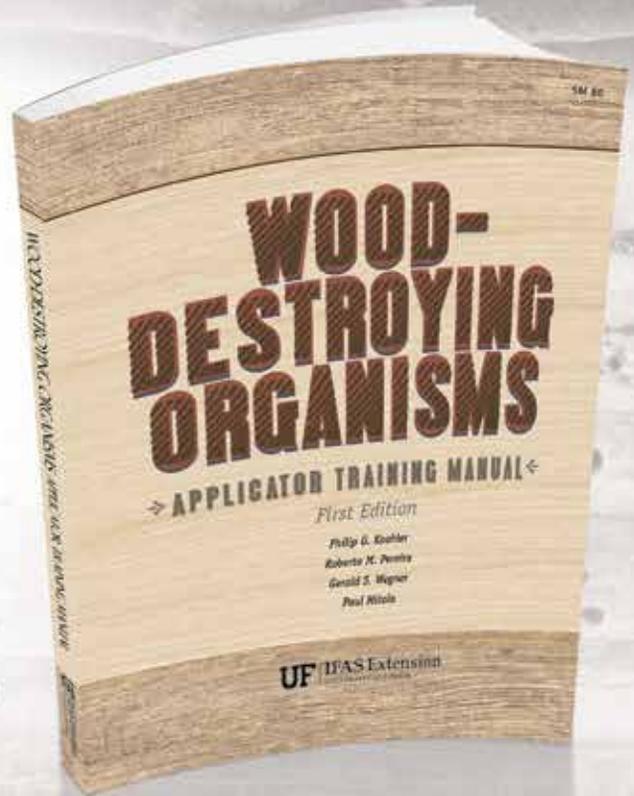
Continued



WOOD-DESTROYING ORGANISMS

⇒ Termites. Borers. Fungi.

What do they have in common? They all can wreak havoc in the wood we use to build. This WDO Manual is full of comprehensive information about insects and other organisms that damage and destroy wood in homes. It is an ideal study guide to prepare pest control operators for their certification exams.



Inside the WDO Manual you will learn about:

- ✓ Insect biology and life cycles
- ✓ Integrated Pest Management
- ✓ Pesticide laws
- ✓ Pesticide safety
- ✓ Pesticide handling
- ✓ Pesticide disposal

UF | IFAS Extension
UNIVERSITY of FLORIDA

ORDERING OPTIONS:

<http://entomology.ifas.ufl.edu/urban>
<http://ifasbooks.ifas.ufl.edu>
(352) 392-1764





Eastern subterranean termite damage in a wall

That is usually when our lab gets to use some of the products for the first time.

Our testing may start with some very simple assays to discover under what conditions the products work, or special aspects that need to be known before we can make the best use of the product under our conditions. Sometimes these tests reveal some interesting aspect of a product's effect on insects.

That happened with chlorantraniliprole, the active ingredient in Altriset, which seemed to make the termites drunk. We had some fun watching termites affected by this chemical having a lot of trouble following a straight line marked with a regular ball point pen on a piece of paper. As you may have seen before, normal termites are very good at following these lines on paper because the ink contains a chemical similar to what is contained in the termites' trail pheromone. However, chlorantraniliprole-affected insects lose muscle control and look like drunken insects failing a sobriety test.

These lab tests are always interesting because they show us some aspects of the product-insect interaction that we cannot usually see in field studies. What we learn helps us explain how the products work, how they should be used, and what effects the pest management professional should expect. It also sometimes results in some fun pictures and videos for our educational programs.

In the case of termiticides, some testing

always has to occur in field sites in Florida. Because Florida has more termite pressure than anywhere else in the continental United States, testing new termiticides here is always the hardest test these products will go through before they can become readily available commercial products.

A TYPICAL TERMITE FIELD DAY

Field tests are usually done in typical insect infestations so that the results can be directly related to normal insect problems the pest management industry deals with all the time. Normally, a number of structures with termite infestations are selected to fulfill the requirements of the experiment. Depending on the information that the product manufacturer needs, different types of termite infestations are required. Testing termiticides in uninfested structures is always risky because it can be years before termites find the structure and attempt to damage it. So it is always easier to start with infested structures unless the product, the manufacturer, and/or the state and federal authorities in pesticide registrations indicate otherwise.

Within the potential infested structures, there are always some criteria that must be fulfilled in order to qualify the structure for the experiments. Location of the infestation, degree of damage to the structure, conducive conditions, and other aspects must be considered and discussed with the manufacturer, and potentially with federal and state regulators. *Continued*



Conducive conditions caused by firewood touching a home's exterior siding





Eastern subterranean termite damage in a pole barn



Termite mound and mud tubes in a crawlspace

VISIT ZOËCON BOOTH 1031 AT PESTWORLD OCT. 18-21, 2016



NIGHT TERRORS FOR BED BUGS...



IT'S LIGHTS OUT FOR BED BUGS
Claw back sleepless nights from bed bug infestations in residential and commercial accounts with Gentrol® products. Designed for pros by pros who understand PMP challenges, Gentrol® products can stop bed bugs before they take over.

LEARN MORE AT ZOECON.COM

GO SOCIAL



Always read and follow label directions. Zoëcon with design and Gentrol are registered trademarks of Wellmark International. ©2016 Wellmark International.



Typically, for termiticide testing, structures are selected, and the products are applied by pest control companies following instructions on the labels from the product manufacturer. For new products coming into the market, it is common for us to check on the treated houses after one, three, six, nine, 12, 18 and 24 months, then yearly after that for up to five years. The five-year period is basically dictated by state laws that require termite treatments to be effective for a minimum of five years.

At each of the visits we usually do a general termite inspection, concentrating on the site of the infestation, then checking other areas in the structure for any signs of termite infestation. Visual inspection and knocking on baseboards and other wood materials are the basis of the inspection, but we also use a few gadgets we have in the lab.

One of the best tools we have for these inspections is the Termatrac we have been using for a while now. We have one of the fancy new instruments that can detect termite movement, as well as a moisture detector and an infrared thermometer to measure the temperature. It is especially helpful to have measurements from before the termites were controlled, so one can have a standard for comparison. Both a drop in the moisture in the walls and a rise in temperatures are good indications that the termite activity within a wall void has decreased or ceased completely. The radar measurements can be the final confirmation that the termites are no longer active within the wall. During the first few months after successful control, it is very easy to see drastic changes in the moisture

and temperature of the affected area, and the complete cessation of termite movement within the area.

During this process, we also take a lot of pictures: first to document the situation before the termite treatment was applied, then to document changes that occurred after the treatment. Because much of the damage occurs within walls, sometimes it is hard to document visible changes in the treated structure. That is why taking notes is also a very important element, especially when it is time to write reports to justify and explain what was done in each of the treated structures. It is also important to document changes that the property owner may make to the structure, especially if these changes facilitate the occurrence of termite damage.

A FEW FINAL THOUGHTS

In recent years, we have worked with different companies in evaluating new active ingredients for the termite control market, new formulations of older products, and new application techniques. It does not matter how much is already known about different termiticides and their application, the market can always use some new approach to termite control. A recent experiment with the bait product Recruit HD is an example of how the industry responds to the needs of customers and pest management professionals.

Also, it does not matter how many termite-infested structures we have seen, there is always some new way that property owners can facilitate the attack by termites. Experiments with new termite product evaluations teach us a lot about how difficult termite control can be, how difficult it is to deal with nonstandard construction techniques, and the myriad of conducive conditions that naturally occur or are created by people.

During the course of these experiments, we learn to appreciate the hard work termite control technicians have to face on a daily basis. Just recently we had fun trying to map the different pillars under a crawlspace house that had been attacked by subterranean termites and was treated with the new high-pressure application of Termidor. We found there is never anything standard about crawlspaces, except that they are usually very hard to navigate, full of loose wires and the potential presence of animals, sewage and other fun things you can find under a house. It really makes us appreciate the softer side of science, when we only have to write reports. **PP**

Roberto Pereira is Associate Scientist and Philip Koehler is Endowed Professor at UF/IFAS Entomology and Nematology Department.



Lance nematode infestation on turf

Photo by William Crow

Nematodes

Lynn Griffith

NEMATODES are not insects, of course, but generally microscopic roundworms. Most are scavengers, eating various types of soil debris. Think about this: When you rake up a pile of leaves and place them by the curb, eventually they disappear, right? Where do they go? Well, in large measure, nematodes eat them. Free-living nematodes are among nature's greatest recyclers.

There are, however, a number of nematode species with more sinister motives. These are the plant parasitic nematodes. They differ from their free-living cousins primarily in that they have a stylet, or little stinger, at the end of their bodies, which they use to penetrate plant parts — usually roots, though sometimes leaves. A nematode looks like a skinny little bag of water that wiggles a lot. They live about 30 days under normal conditions, and may move perhaps an inch during their lifetime.

Among the misconceptions about nematodes is that they make knots in roots. Certainly, one of the major plant pathogenic nematodes, *Meloidogyne*, or root-knot, does make knots or swellings in roots. However, there are about 20 species of parasitic nematodes that never make knots in roots. The knots are often swellings in roots caused by egg masses and juveniles, which are propagated within the roots themselves by root-knot nematodes. Simply put, you don't need to see knots to have a nematode issue.

A second misconception is that there are no labeled nematicides for home lawns and gardens. That is absolutely false, though many pest control operators believe otherwise. There are about half a dozen treatment options, some of them organic. Their efficacy is inconsistent, and will sometimes depend on what type of nematode you are trying to control, but there are some that work. Nematodes are, of course, significant pests of turfgrass, but they attack ornamentals too. Among susceptible species are impatiens, Eugenia, citrus, roses, bougainvillea, crotons, mondo grass, liriopse, and even queen palms and date palms.

Plant parasitic nematodes are not normally on the radar of pest control companies. However, if you find slow-moving areas of decline that do not respond to your normal treatments, keep nematodes in mind as a possible causal agent.

Public and private labs can do nematode assays for a nominal fee, and there are cultural and chemical control options available to deal with these situations. The UF/IFAS Nematode Assay Lab conducts nematode assays and diagnosis beginning at \$20. Visit <http://nematology.ifas.ufl.edu/assaylab/> for more information. **PP**

Lynn Griffith, Tropical Plant and Soil Expert, lynngriffithjr@gmail.com.



Heather plays a round at The Reservation

Heather Erskine:

From Golf Course To Entomological Tour de Force

MULBERRY, FLORIDA, 1968. Heather Erskine's grandfather Edward "Buddy" Erskine purchased 200 acres of reclaimed mine property to develop into a golf course. This was not the first course he had built in Florida, but it would be his last.

Heather's father, Dean, recalls watching his dad "disappear into the tall weeds until one day it finally started to look groomed." Trees had to be sawed down, tee boxes and greens had to be formed, fairways had to be leveled, and sod had to be laid — all by the hands of Buddy. In 1969, the doors of The Reservation Golf Course opened to the public.

Dean remembers driving an old Ford 3000 tractor that pulled a homemade sand wagon to top-dress greens. He was six years old. He worked until the age of 18 without ever seeing a dollar. His work on the Reservation provided him a place to sleep, food to eat, and eventually a degree from the University of Florida.

After graduating with a degree in economics from the college of business in 1982, Dean came back to Mulberry to stay in the family business. "It was a seven-days-a-week job. No breaks," Dean says.

As Buddy got older, Dean assumed all responsibilities from all sides of the business. With little division of labor, he was superintendent, pro-shop manager, greens keeper, mechanic, and financial and operational head. With three daughters, Dean knew that they would put their time in on The Reservation as he did. "It was a calculated decision on my part, as well as my dad's, to have my kids work when they were old enough to work. I wanted to teach them the right lessons in life. They got to meet real people, stayed out of trouble, and learned what it meant to earn a dollar. Plus, I needed the help." Heather worked on the course from age 12 to 21.

Heather grew up with a dream to get her degree from UF and always entertained the idea of keeping in the family business. However, the last round of golf was sold in 2012. When the doors of The Reservation Golf Course closed, so did that possibility for Heather. "It was a gift to us both," Dean says. They both agree that it extensively shaped them into the people they are today. "There was no other place like it. Not anywhere on this earth."

In 2013, Heather was accepted into the University of Florida's Entomology and Nematology Department. She graduated with a specialization in Biosecurity and a certificate in Urban Pest Management. She is working on her master's degree in Dr. Koehler's Urban Entomology Laboratory. Heather is glad to have found another blue-collar world and shares her story of discovering her interest in Pest Management.

First and foremost, how did you end up in entomology?

I can't tell this story without describing my passion for the FFA (Future Farmers of America). From freshman to senior year of high school, I indubitably dedicated myself to this organization. My voracious involvement in the FFA allowed me to gain good public speaking experience, travel the country, show hogs and steers in the county fair, and take part in camps, such as Forestry Camp, where I learned about Florida dendrology and how to measure trees for timber. FFA also got me participating in CDEs (Career Development Events), where I judged livestock and citrus crops, and serving in leadership positions. I ended my FFA career as president of our chapter. The list really goes on and on, but the best thing that came out of all these experiences was getting excellent exposure to the slew of career possibilities within the agriculture sector.

We are better able to understand evolution, human genetics and lifespan, disease cycles and impact, and ecosystem interactions and health through studying insects."

— Heather Erskine

DURING my junior year, Polk county FFA members had the opportunity to visit agriculture universities in the southeast to learn about the different programs and majors. I will never forget how impressed I was after my first visit to the Entomology and Nematology Department during our stop at UF. I vividly remember the tour of Dr. Koehler's Urban Entomology Lab — who could forget that, though? As the tour wrapped up and we were making our way back to the vans, I lingered to talk to the undergraduate academic advisor of the department. That conversation and tour really resonated with me and is largely the reason why I am here today.

Have you always liked insects?

I was not the kid that made elaborate insect collections or reared them as pets. But I was the kid that picked weevil grubs out of acorns and fished for doodle bugs (immature antlions). So I suppose the answer is still “yes.” I grew up on a family-owned golf course, and was taught how to work at a young age. When other kids were free to play during the summers between the school years, I was put to work out at The Reservation Golf Course.

One summer when I was around the age of 14, I had a “pet” spider that lived in the work shed where I parked my mower. When I would come in from mowing, the mower would usually be covered in sod webworm moths and lovebugs. I would drop some of each in the spider's web and watch it gobble down the moths and pick the lovebugs out from its web, letting them fall to the floor. I found it so fascinating that it would eat one, but not the other!

I did not realize back then how much we are able to learn from insects. I did not know that we are better able to understand evolution, human genetics and lifespan, disease cycles and impact, and ecosystem interactions and health through studying insects. But, yes, I still liked them nonetheless.

Tell us about The Reservation. What kind of work did you do?

I watched my sister, who is 10 years older than me, work out there — and I could not WAIT until I was old enough and big enough to do all that she did. I was 12 when I was finally awarded some serious responsibility. My dad handed me a bucket and pocket knife and walked me out to the collar of green No. 2. We squatted down, and he pointed out goosegrass and crabgrass, teaching me how to tell them apart. “We want uniform Bermuda grass growth out here,” he would tell me.

He inserted his knife just below the crown and gently plucked out a young goosegrass



Insecticide research is just one of many opportunities Heather has found at the Urban Entomology Lab.



experts + solutions + locations = the perfect formula

Deerfield Beach

1031 SW 30th Ave
Deerfield Beach, FL 33442
(954) 866-1700

Jacksonville

7380 Phillips Highway Suite 101
Jacksonville, FL 32256
(904) 296-2501

Tampa

5410 Pioneer Park Blvd
Suite A
Tampa, FL 33634-4479
(800) 399-0469

Fort Myers

12621 Corporate Lakes Dr
Unit 2 & 3
Fort Myers, FL 33913
(239) 790-4988

Orlando

3071 North Orange Blossom Trail
Suite T
Orlando, FL 32804
(800) 667-7410

1-855-RESIDEX | manage your account online at www.residex.com



patch from the fringe, and I followed suit. I sure thought I was top dog of weed control out there!

As I grew, so did my course responsibilities. In middle school, my work consisted of changing the holes on the greens, driving the work truck around the course to pick up limbs and debris to haul to the burn pile, pro shop janitorial duties, washing and charging golf carts at the end of each day, and moving tee markers. In late middle school/early high school, mowing was added to the list. I started mowing roughs with the deck mower and later tee boxes and collars with a reel mower. Eventually, I was taught how to mow with our tractor-drawn gang mower before we graduated to a Jacobsen 3800 fairway mower.

The big promotion happened when I turned 16. Once I could drive, I was responsible for getting all the greens mowed before the golfers showed up on the weekends. I held that position all the way to the end. I was also taught how to mix herbicides and spray along fence lines or around trees and spot-treat on greens.

Activities like stretching fence, digging holes, arc welding, chainsawing trees, changing tires, and working a payloador are not typical work experiences gained by young females, but allowing me to bust up my knuckles every once in a while and teaching me not to be afraid of hard work is hands down one of the best gifts my dad has ever given me.

So why did you decide to study urban entomology, specifically?

To be honest, I never would have picked this route on my own. I remember applying to the University of Florida and having to choose my specialization on the online application. I blew over "Urban Pest Management" and selected "Biosecurity" since after all, it was directly related to safeguarding American agriculture.

I also met with the advisor of the turfgrass program when I first came to the university. I wanted to know if there were career possibilities within the golf industry available to someone who dual majored in entomology and turfgrass management. The conversation with that professor

forced me to choose one side or the other, and I abandoned my familiar roots to completely jump aboard the entomology wagon.

During my first year here, I worked with cactus and squash bugs in an evolutionary ecology lab and with invasive pest insects, like the brown marmorated stink bug, in the department's quarantine lab.

It wasn't until my senior year that I stumbled into Dr. Koehler's office. I was awarded the IFAS Summer Research Internship, and was paired up with him to do a study on bed bugs. This was a fantastic internship opportunity that allowed me to obtain and complete an independent research project. Before I knew it, I was an active member of the Urban Entomological Society, was attending NPMA, FPMA and Southeast Pest Management conferences, and joining Dr. Koehler in giving CEU presentations in various parts of the state. It didn't take me long to realize that there was something very special and unique about this lab and this industry. I bit the PMP bait — hook, line and sinker.

Continued on page 30



Pregnant women should see their doctor or other healthcare provider about getting tested for Zika. All pregnant women in the United States should be evaluated for possible Zika virus exposure during each prenatal care visit.

Zika Locally Transmitted in Florida

THE CENTERS for Disease Control and Prevention (CDC) has been working with Florida health officials on investigating cases of locally transmitted Zika virus. Areas of active Zika transmission have been identified in Miami-Dade County. The Florida Department of Health has also identified other instances of apparently mosquito-borne Zika in Miami-Dade County, and has reported an increase in travel-related cases.

CDC and Florida health officials recommend the following:

- Pregnant women should avoid travel to areas where active local transmission of Zika has been confirmed.
- Pregnant women and their partners living in or who must travel to areas where active local transmission of Zika has been confirmed should follow steps to prevent mosquito bites.

- Pregnant women should see their doctor or other healthcare provider about getting tested for Zika; and people who have a pregnant sex partner should consistently and correctly use condoms to prevent infection during sex or avoid having sex for the duration of the pregnancy.
- Pregnant women and their sexual partners who are concerned about potential Zika virus exposure may also consider postponing nonessential travel to all areas where active local transmission of Zika has been confirmed.
- All pregnant women in the United States should be evaluated for possible Zika virus exposure during each prenatal care

visit. Each evaluation should include an assessment of signs and symptoms of Zika virus disease (acute onset of fever, rash, arthralgia, conjunctivitis); their travel history; as well as their sexual partner's potential exposure to Zika virus and history of any illness consistent with Zika virus disease to determine whether Zika virus testing is indicated.

- Women with Zika should wait at least



The right product is just the beginning.*

Drive business with
UNIVAR

Get in touch with your local rep and discover how Univar can help you drive business.

Call us at **800-888-4897**
or go to **PestWeb.com**

© 2015, Univar USA Inc. All rights reserved. UNIVAR, the hexagon, and other identified trademarks are the property of Univar Inc., Univar USA Inc. or affiliated companies.

2016 ZIKA RESPONSE CDC IN ACTION

- Tracking the spread of Zika virus and other mosquito-borne viruses in the United States and around the world.
- Training disease detectives to find and report Zika cases.
- Teaching healthcare providers how to identify Zika.
- Testing samples for Zika and providing laboratories with diagnostic tests.
- Studying links between Zika and birth defects and Guillain-Barré syndrome.
- Educating the public about Zika virus.
- Advising travelers how to protect themselves while traveling in areas with Zika.

- eight weeks after symptoms start before trying to get pregnant.
- Men with Zika should wait at least six months after symptoms start before couples try to get pregnant.
 - Women and men without confirmed Zika who traveled to this area should wait at least eight weeks before trying to get pregnant.
 - Women and men who live in or frequently travel to areas where active local transmission of Zika has been confirmed and who do not have signs or symptoms of Zika should talk to their healthcare provider to inform their decisions about timing of pregnancy.

Every community in the United States that has the *Aedes aegypti* mosquito present must monitor for infections and work to control the mosquitoes.

Detecting local spread of Zika is difficult for several reasons:

- The incubation period for Zika infection is up to two weeks,
- A high proportion of infected people have no symptoms, and

- Diagnosis and investigation of cases takes several weeks.

Besides the areas where active local transmission of Zika has already been confirmed, other areas may also have active Zika transmission that is not yet apparent.

CDC advises those living in or traveling to Miami-Dade County to enhance their efforts to prevent mosquito bites. Pregnant women and their sexual partners who are concerned about potential Zika virus exposure may also consider postponing nonessential travel to all parts of Miami-Dade County.

It is understandable that women will be especially concerned, and there are things that everyone can do based on what is currently known. While there are still many unanswered questions about Zika, CDC is working hard to find out more about these infections. Here is what is known:

- Zika is spread to people primarily

through the bite of an infected *Aedes* species mosquito (*Ae. aegypti* and *Ae. albopictus*).

- A pregnant woman can pass Zika virus to her fetus during pregnancy or around the time of birth.
- Zika virus infection is associated with birth defects and adverse pregnancy outcomes, especially microcephaly.
- A person who is infected with Zika virus can pass it to sex partners.
- Most people infected with Zika virus won't have symptoms or will only have mild symptoms.
- No vaccines or treatments are currently available to treat or prevent Zika infections.

For more information about Zika:

<http://www.cdc.gov/zika/>

The Next *EVOLution* of Bait Stations



ONE KEY, ENDLESS SOLUTIONS



- ▶ Maximize your time at accounts with Bell's EVO bait stations
 - Fast opening EVO key
 - Designed for quick cleaning
- ▶ Innovative designs for all of your baiting needs

EXPRESS **AMBUSH** **CIRCUIT** **MOUSE** **LANDSCAPE**



THE WORLD LEADER IN RODENT CONTROL TECHNOLOGY®

www.belllabs.com | Madison, WI 53704 USA • Available from your Bell Distributor



SEEKING EMPLOYMENT?

You've checked out the rest....

Now join the best!

- Competitive Salary
- Medical, Prescription, Dental & Aflac
- Retirement Package
- Company Provided Life Insurance
- Career Advancement Opportunities
- Drug Free Work Environment

Visit us at

flapest.com



THE CARLI GROUP

PEST CONTROL BUSINESS ADVISORS

MAKE YOUR COMPANY BETTER.

...

We know pest control. We know pest control business ownership. We sold our own 21-year-old Florida pest control business to the sixth-largest pest control company in the nation, and we can put our real-world expertise to work for you. Ask yourself ... do you own your company or does your company own you?



Michael and Mary Carli
813.766.9056 • info@thecarligroup.net
www.thecarligroup.net

CALL US TODAY FOR YOUR FREE PHONE CONSULTATION

In just six months,
The Carli Group helped me
take my company to the
next level.

Patrick Bruner
Advanced Pest Management
Indianapolis



Why You Should Seriously Consider Selling Your Company NOW, Part II

John P. Corrigan, Esq., Dan Gordon, CPA, and Norman Cooper

Part I of this article appeared in the May/June issue of PestPro.

IF A COMPANY owner is pondering the idea to sell or not to sell, thoughts that run through a person's mind are often as follows:

1. What is my business worth in terms of an expected sale price?
2. Are other prior transactions in the industry comparable to the worth of my company?
3. How do I find data about other transactions to be able to compare my business?
4. Does the global and national economies affect the time to sell or hold?
5. Is the pest control industry stable in terms of year-over-year expected transaction prices?
6. Who would be the best buyers in terms of price and/or strategic fit?
7. How do I contact such prospective buyers?
8. Who should I contact to evaluate whether it makes sense to consider starting the process?
9. Will I need help from lawyers, accountants and/or business brokers?
10. Can I do this on my own by just speaking with friendly colleagues who are in the same boat?
11. What is involved process- and cost-wise to commence and conclude a sale transaction?
12. How long does a typical deal take from beginning to end?
13. What are the tax implications for selling a company stock vs. company business assets?
14. What can I expect in terms of transaction costs for professionals involved (if required)?
15. What would I do if there were no more business to show up to work for post-closing?

Once these questions are asked, what should one do next? Ideally, a seller should find a professional who can assist you:

- ◆ In helping to establish the true value of your company,
- ◆ in determining when the time is right for you to sell,
- ◆ in utilizing the company's numerous business contacts,
- ◆ in assisting you to decide if it is advisable for you to consider dealing with investment banking firms, private equity groups, or even with nontraditional service companies.
- ◆ in negotiating the price, the terms, and the contingencies,
- ◆ in advising how you may legally minimize taxes,
- ◆ in helping you decide if you want to stay on after the sale with the company and in what capacity,
- ◆ in clarifying the terminology of contracts, proposals and vital "details" that can cost you money.

Albeit many sellers feel their local attorney or CPA can probably represent their interests in all of the above matters, one should not be dismissive of retaining a business broker with specialized knowledge in the industry in which they represent their clients. For example, a business broker who understands financial statements, tax implications, leverage, deal structures, and contract structure is not enough to ensure that the best deal for a seller is obtained. Accordingly, very few business brokers have a handle on the critical aspects of a pest control business and what factors drive the value up and what factors will be deemed negatives, both large and small.

In addition, a business broker that only handles pest control deals will have much more street smarts as to the pool of prospective buyers, what they are looking for in terms of prospects, what prices they are paying, and the types of deal terms (other than price) being offered.

Regardless of the process a seller chooses to undertake in terms of hiring one or more professionals, if a decision to do a deal has been made, a seller should embrace and follow basic principles about taking a deal to closure:

- ◆ Do not do a deal on a handshake, as each party's perceptions of what was agreed may differ.
- ◆ Understand the material tax differences from selling stock or selling assets.
- ◆ Always have a fulsome LOI prepared by a lawyer who can narrow down issues.
- ◆ All lawyer do not have M&A expertise because they handle other business contracts.
- ◆ M&A transactions have significant tax ramifications requiring tax as well as legal knowledge.
- ◆ Use your CPA to organize your records or assist in reviewing other party's records.
- ◆ Do not assume the LOI is the last word on the deal as it is but a summary.
- ◆ Be prepared for additional business, tax and legal points to be negotiated post LOI.
- ◆ Do not let lawyers add different/additional terms if business principals have not discussed.
- ◆ Do not assume the purchase and sale agreement is standard contract with boilerplate language.
- ◆ Always read the purchase and sale agreement, and ask questions if any provisions are unclear.
- ◆ Offer the buyer limited representations, warranties, covenants and indemnifications.
- ◆ Seek collateral or buyer guarantees if a portion of the purchase price is paid over time. **PP**

The authors are the managing directors of PCO M&A and Succession Specialists, LLC, an affiliate of PCO Bookkeepers. For more information about us send an email to info@pcobookkeepers.com or visit <http://www.pcobookkeepers.com/selling.html>

GIVE BEES A CHANCE

NO SPRAYING PLEASE!

beeshealthygardens

Using Neonicotinoids In the Landscape

Adam Dale and Erin Harlow

What are neonicotinoids?

Neonicotinoids are the most widely used insecticides in the world. They include the active ingredients **imidacloprid** (Merit, Marathon, and generics), **dinotefuron** (Xylam, Safari), **clothianidin** (Arena), **acetamiprid** (TriStar), and **thiamethoxam** (Meridian), or a **combination** (Triplecrown, Allectus).

These products exhibit both some contact and systemic properties and are normally used to treat insects with piercing-sucking mouthparts in the landscape such as thrips, whiteflies, chinch bugs, and scale and chewing insects in turf including grubs, mole crickets and billbugs. You may have incorporated these products into your program through several application methods, including foliar applications, soil drenches, and soil or tree injections.

By now you may have heard about restrictions placed on neonics related to pollinator protection, and risks to the environment associated with neonicotinoid products. Have these changes really affected the industry, and if so, how?

While some countries have completely banned neonics, they are still allowed in most of the United States, with label restrictions. There are a few counties in Maryland and

Colorado that have banned neonics, so check with your local area, but neonics are not banned in Florida at this time.

Most neonics have a pollinator protection box on the label that highlights specific instructions with language such as, “Minimize exposure to bees and other pollinators,” or “Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.” If that language is on the label, then you cannot apply the product to the plants if pollinators are visiting even if you are treating turf and they are visiting the weeds in the turf.

Some labels also read, “Do not apply this product to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period — for instance, 38 hours after application, according to the Safari label. As an applicator, you may have to consider alternative chemistries instead of relying

on neonics. Make sure you read the labels carefully so you can assure you are making the application safely, correctly and according to label directions. Changes to neonics are also coming to homeowner products. Both Lowe’s and Home Depot are phasing out neonic products on their shelves by 2019 and 2018, respectively.

Okay, so what are our alternatives?

To minimize risk to pollinators, pest managers should use products that are highly selective for the target pest and relatively nontoxic to beneficial insects. Pest managers running an IPM program have been doing this for decades to reduce nontarget effects on biological control organisms.

Neonics are the most common class of insecticides that people have gone to for high selectivity and low nontarget toxicity. Given recent developments, this mode of thinking may need to be reconsidered. Research has shown that neonics are toxic to bees and pose risks to pollinators when applied improperly. The key is using them properly by following the pollinator protection labeling and by not applying product to flowering plants or when bees are foraging. Therefore, the products that can be used may often change, depending on the host plant being treated.

Soaps and Oils

Insecticidal soaps and horticultural oils are among the most recognized beneficial-compatible products. These can provide excellent control. However, they are not always appropriate, depending on the target pest, host plant, and landscape requirements.



Neonics are toxic to bees and pose risks to pollinators when applied improperly.



Photo at top by Madronna Holden

Continued next page

Biopesticides

Biopesticides provide another option to control plant pests and have minimal impact on pollinators and other beneficial insects. These include naturally occurring bacteria (*Bacillus thuringiensis*, *Chromobacterium subsugae*, spinosad), fungi (*Metarhizium anisopliae*), and plant-derived compounds like azadirachtin. Many of these products provide excellent control of pests but require a good understanding of each, because some have shorter residual activity, need to contact the pest, or have other cultural requirements for good control.

Synthetics

There are also several synthetic insecticides shown to control pests and pose little risk to pollinators and beneficial arthropods. These products are classified by the EPA as “reduced risk” based on several metrics including low nontarget toxicity, high selectivity, low use rates, and compatibility with IPM practices. Reduced-risk active ingredients that have shown minimal toxicity to pollinators include acequinocyl, acetamiprid, chlorantraniliprole, pymetrozine, pyriproxyfen, spiromesifen, and tebufenozide.

DESPITE the reduced toxicity of these products to pollinators, they must still be applied in consideration of pollinators and other beneficial insects. Most remain toxic to pollinators when in direct contact. Therefore, they should not be applied directly to flowers or areas when bees are foraging.

Although these products will not solve all insect management needs, they do provide alternatives to help pest control managers navigate the increasingly turbulent landscape pest control waters. A massive amount of ongoing research is investigating the effects of pesticides on pollinators worldwide and regularly providing new information.

What is the future of landscape pest management?

The landscape pest control industry is changing, as illustrated by recent pollinator protection labeling on insecticides, big-box stores phasing out neonic product sales, and major, over-the-counter brands canceling the production of neonic products. The tides appear to be shifting toward stricter regulation of insecticide use to manage landscape pests. This means that exploring new cultural pest control strategies, biological control tactics, and newer chemistries are more important than ever.

Exploring these new pest control strategies is important now for more reasons than insecticide regulations, though. As Florida’s population grows, land is developed, and natural resources like water become less available, the integration of tools used to manage pests will have to adapt. For that reason, stricter regulation may serve as a catalyst to help drive innovative pest management strategies that benefit landscape pest management, the environment, and the future of Florida’s green industry. **PP**

Adam Dale is Assistant Professor in the UF Department of Entomology and Nematology specializing in turf and ornamentals, and Erin Harlow is Commercial Horticulture Agent for UF/IFAS Extension in Duval County.

Liability · Auto · Workers comp · Property · Health & Life

GREAT SCOT! INSURANCE

• Specializing in all insurance needs of the PCO. We've been insuring pest control companies for over 20 years.



DON'T BE BUGGED
with your insurance program!

Visit us at
www.gsiinsurance.com
12155 Metro Parkway, Ste. 28A
Ft. Myers, FL 33966-8302

CALL DAN WALL OR ROD WRIGHT
800-927-0418

THINKING OF SELLING?

THE DIFFERENCE BETWEEN CLOSING A DEAL FOR A "MAXIMUM PRICE" VS. LEAVING MONEY ON THE TABLE GREATLY DEPENDS ON THE ADVISORS WHO REPRESENT YOUR INTERESTS.

Our highly skilled team includes CPAs **Dan Gordon**, tax attorney **John Corrigan**, and seasoned industry M&A specialist **Norman Cooper**. They will guide the entire transition process, including negotiating, clarifying relevant contractual documents and will serve as your advocates in:

- Determining the best time to sell
- Establishing an appropriate selling price within an acceptable range of values
- Evaluate ALL relevant, non-financial aspects
- Utilizing our vast industry-contact base
- Presenting your company in the best possible light
- Developing the deal structure in order to maximize after-tax proceeds.

GET SMARTER! Call **Daniel Gordon, CPA** at 973-300-0288 ext. 201 or email dan@pcobookkeepers.com to discuss your requirements and how we can help you. Download our whitepaper at: www.pcosuccessionplan.com



PCO
M&A and Succession Specialists
The Pest Control Industry's Most Trusted Advisors
PCO M&A and Succession Specialists is a division of PCOBookkeepers.com

OLIVE TREES: Coming Soon to a Landscape You Manage. Learn What to Expect!

Jennifer Gillett-Kaufman

A FEW years ago I was in the garden section of a local hardware store when I found a plant I had not seen for sale in Florida before. That plant was an olive tree, *Olea europaea*. These are real olives that you can use to make oil, or you can pickle them and slice them over a pizza.

These olives are not the same as the ornamental black olive tree many of you might be used to working with. I am very skeptical about new plants in garden centers because I always want to put the right plant in the right place. I decided to do some searching online to see what UF/IFAS guidance was available on olives in Florida. I was shocked when I could not find any. This put me in motion to learn what I could about olives being grown in Florida and to do my best to provide that information to people that might be interested in planting olives in their landscapes.

Olives grow on a beautiful, silver-gray tree (Figure 1) and can easily be incorporated into most landscapes. If you want to learn more about how to care for olives in Florida, I would suggest you read *Olives for Your Florida Landscape*, by Thetford, Gillett-Kaufman, and Mulvaney¹. This article will help you see if there are cultural practices that might be harming the tree — was the tree planted in a wet area, overwatered, planted too deep, or planted in too much shade?

As many of you may know I am an entomologist, so my first task was to determine what if any pests were found on olives. To do this I found a few olive farmers in Florida and started to look over their trees for pests — yes, olives are grown here commercially, and you can buy Florida olive oil if you know where to look.

I also contacted our UF/IFAS County Extension faculty to see what homeowners with olives were reporting. Don't forget, you have an office that can help you in every Florida county². I found quite a



Figure 1. A seven-year-old olive tree, *Olea europaea* 'Mission,' in Marion County, Florida. *Note:* The trunk of this tree has been painted white, a common practice for olive growers in the Mediterranean region.



Figure 2. Ripening olive fruit and foliage.

Two insects you should look out for if you are working on an account with olive trees are the rustic sphinx hornworm caterpillar (3) and black scale (4).



Figure 3. Larva of the rustic sphinx, *Manduca rustica*, on an olive branch.

Figure 4. Black scale crawlers, nymphs and adults on an olive tree in Marion County, Florida.

few insects feeding on olives, but none were really causing so much damage that treatment was necessary.

Homeowner complaints you might receive about olives fall into four categories: 1. Not enough fruit (or no fruit), 2. Too much fruit, 3) Leaves are missing overnight, and 4) Sooty mold (this complaint is often in conjunction with a complaint about ants).

If you have a homeowner with the first complaint, it usually stems from the fact that olives need to cross-fertilize. If a homeowner has only one tree and there are not nearby olives, they will not get fruit. The publication *Olives for Your Florida Landscape* has a helpful table you can refer your clients to so they can choose the best pollinating variety to complement the tree they already have.

If a homeowner is complaining about too much fruit, it is usually because they planted the tree too close to a hardscape in the landscape. When this happens, fallen fruit can be a nuisance for the homeowner.

Complaint 3, leaves are missing overnight. The culprit: the rustic sphinx hornworm caterpillar, *Manduca rustica*. This hornworm looks a lot like the tomato hornworm you may have seen munching on tomatoes and peppers in your garden. This hornworm can get almost 4 inches long and

¹ <http://edis.ifas.ufl.edu/ep515>

² <http://solutionsforyourlife.ufl.edu/map/>



Photo of Jennifer Gillett-Kaufman by Alex Catalano

is a voracious eater. Clients may complain of leaves being stripped from the tree and could claim they think it is a rabbit (for lower branches) because the frass made by these hornworms can be similar in size to rabbit droppings. The adult rustic sphinx moth lays eggs singly and moves on, so you will not often find more than one caterpillar on a tree. The easiest management tactic is to remove by hand and smash the caterpillar. If you do choose to use a chemical treatment, remember to choose one labeled for a fruit or olive tree.

As far as pest management complaints are concerned, complaint No. 4 has you covered on two fronts — insects and sooty mold. The black scales I mentioned earlier excrete honeydew, and that is the perfect food for sooty mold. This is usually just a foliar problem and customers might be complaining that their once-silvery, beautiful tree is now black and gray. Wherever honeydew falls sooty mold can grow, so if they have patio furniture, a car, or even more plants under an olive tree with black scales, you could end up with sooty mold on these items as well.

Most of you know sooty mold can be washed away and, with successful management of the scales, it should not return. Any soap or oil labeled for scale management on fruit trees should work to manage black scale on olive. Do remember that olives are considered a fruit, so any products used on them should be labeled for use on a fruit tree or specifically on olive trees.

The second part of this complaint is ants. Black scale can be tended by several different species of ants in Florida. All of these ants are looking for one thing: a sugary sweet meal, honeydew. Once the scales are removed from the plant the ants will move on, in search of another food source. Keep in mind that treating ants around olives requires a pesticide treatment that can be used around fruit trees. Read the label to be sure you are not misapplying the ant bait you always reach for!

To learn more about olive pests you might like to review: *Pests and Fungal Organisms Identified on Olives (Olea europaea) in Florida*, by Gillett-Kaufman, Allan, Bosquez-Mendez and Buss³. This article is also available in Spanish⁴, if you have Spanish language speakers on your L&O crew.

As more landscapers and homeowners add olives to their design pallets, the more you will be exposed to them in the landscape. Fortunately, these plants are relatively pest- and disease-free, and with the tips outlined in this article you should have no problem managing them.

If you do find a pest on olive that is not mentioned in the *Pests and Fungal Organisms Identified on Olives (Olea europaea) in Florida* article, please let your local UF/IFAS County Extension faculty member or me know and we will do our best to help you develop a management solution. **PP**

³ <https://edis.ifas.ufl.edu/in1046>

⁴ <https://edis.ifas.ufl.edu/in1052>

DON'T ENCASE THEM... KILL THEM



**Stop the Bites...
...Prevent the Infestation**

- Starts working within 10 minutes
- Provides Prevention & Control for 2 years
- Easy to Install

 **ActiveGuard® Mattress Liners**

www.allergytechnologies.com • (866) 978-6288

Termite Control Contracts

THE FLORIDA STATUTE 482 and Rule 5E-14.105 spell out exactly what the pest management professional needs to know about termite control contracts. Each licensee must enter into a written contract with the property owner or his/her authorized agent for control or prevention of wood-destroying organisms. The contract must be provided for acceptance or rejection prior to any portion of the work is done and before payment, in part or full, is received by the licensee.

The contract shall clearly state the following information:

- complete name and address of the property owner or authorized agent,
- complete address of the property to be treated,
- buildings or structures on the property to be included for treatment,
- complete name and business address of the licensee,
- date upon which the written contract is entered into,
- period of time covered by the contract and renewal option, if any,
- complete common name(s) of the wood destroying organism(s) to be controlled or for which preventative treatment is intended,
- location within the structure of the treatment notice/sticker which must be at least 3 x 5 inches and last at least three years.

The contract must clearly state on the front page:

- termites covered (subterranean, drywood, or both),
- any termite excluded from the coverage,
- whether the treatment is offered for control of existing infestation or prevention of infestation,
- whether or not reinspections are to be made under the contract and the approximate time intervals between inspections,
- conditions under which retreatments for reinfestation will be made,
- conditions under which repairs will be made, if any,
- total maximum price to be charged for treatment service,
- exact annual renewal fees to be charged under the contract, if any,
- fees other than the renewal fee, if any
- total maximum price to be charged for

structural repairs, if any, shown separately.

The signatures of the licensee or representative, the property owner or authorized agent must appear on the contract. Contracts covering preconstruction treatments for subterranean termites shall clearly set forth that additional treatment(s) shall be performed to control an infestation should one occur to the structure during the warranty period.

The warranty shall:

- show the date of the initial or final treatment,
- be issued to the property owner within 30 days of the date specified on the contract, and be valid for a period of not less than one year,
- have an optional extension for an additional four years,
- conform with Section 482.227 and contain information required by 5E-14.105.

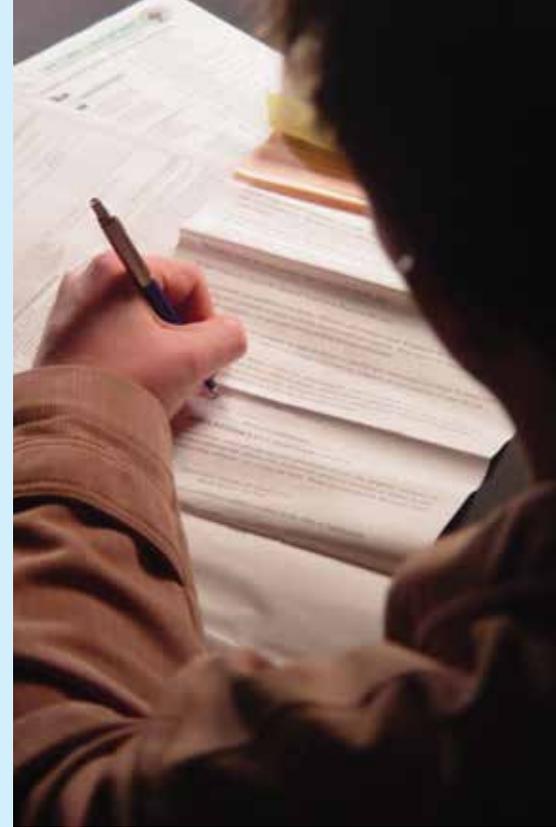
For multiple properties of a single owner, if individual contracts are not issued prior to treatments, a licensee shall either:

- enter into a master agreement with the owner prior to treatment that provides for the fulfillment of the law requirements, or
- issue an assignable contract on the property on completion of the treatment. This applies only to treatment for the control of subterranean termites for new construction that does not physically attach to or adjoin existing structures.

Structure foundation graphs/diagrams prepared during WDO inspections of properties and in preparation for treatment, showing details of termite and other WDO activity and damage sites as well as treatment methodology, should be retained as documentation.

Contracts covering spot treatments for wood-destroying organisms shall meet the requirements in the law. Also, any specified areas in, on, or under the structure to be treated shall be listed in the written contract. A statement that a spot treatment only must be added to on the treatment notice posted. If no responsibility is to be assumed by the licensee for retreatment of the specified area(s) of a structure where the spot treatment is to be made, the licensee shall furnish the property owner with a signed statement to this effect, prior to treatment.

When periodic reinspections are specified in wood-destroying organism preventative



or corrective control contracts, the licensee shall furnish the property owner a signed report of the condition of the property with respect to the presence or absence of wood-destroying organisms covered by the contract and whether retreatment was made. A copy of the inspection report shall be retained by the licensee for not less than three (3) years.

A structure shall not knowingly be placed under a second contract for the same wood-destroying organism in disregard of the first contract, without first obtaining specific written consent signed by the property owner using FDACS form 13671 Consumer Consent Form.

All wood-destroying organism protection contracts must comply with the following:

- A licensee must inspect for an infestation that is included under a retreatment provision of a contract within 30 days of written notification by the property owner, and must perform a retreatment within 90 days of discovery of an infestation unless:
 - o access to the property is prevented, or
 - o the treatment is waived or postponed in writing, or
 - o the subject property is a commercial or multiunit structure, for which treatment must occur within 180 days. (In the event that the contract expires before a retreatment can be accomplished, the licensee shall make a written offer to perform the retreatment within 90 days at no additional charge). *Continued*

Preventive Treatments

Permit 482.0815 is required prior to preventative treatments for new construction and must be displayed in the business location of the licensee. Pesticides used as the primary treatment for the prevention of subterranean termites for new construction shall be applied in the specific amounts, concentrations, and treatment areas designated by the label, and shall be mixed at the treatment site immediately prior to application. A secondary treatment using a second pesticide registered for preventative treatment for new construction may be applied in accordance with label directions.

Treatment records for the prevention of subterranean termites for new construction shall be maintained by the licensee and shall contain:

- date of application,
- address of the property,
- total square footage of the structure,
- pesticide used,
- percent concentration of mixture applied,

- total volume applied,
- total amount of area treated, and
- total number of sites treated for the prevention of subterranean termites.

Redress of Service Issues

A licensee may not use a limitation, exclusion, or condition clause to deny treatment of a termite infestation or repair of termite damage to the holder of a contract, unless:

- the infestation or damage was primarily caused by the subject of the limitation, exclusion, or condition clause in the contract,
- the licensee was aware of the condition and provided written notice to the property owner of that condition within 60 days of discovery,
- the licensee provided the property owner the opportunity to correct the condition, and
- the property owner did not correct the condition within the 60 days of the written notice.

Under such circumstances of property owner or agent noncompliance, the licensee may use the limitation, exclusion, or condition clause in the contract to deny repair or retreatment.

Guarantees and Warranties

Contracts for wood-destroying organisms must state on the front page in BOLD print that the contract is offered:

- for repair and retreatment, or
- for retreatment only, or
- that no warranty or guarantee is offered, or
- whether the contract contains any disclaimers, limitations, conditions, or exclusions.

Contract sections describing disclaimers, limitations, conditions or exclusions must contain headings in BOLD print, and contracts with disclaimers, limitations, conditions or exclusions may not refer to "full" or "unlimited" guarantee or warranty. **PP**

Report by Paul Mitola, Florida Department of Agriculture and Consumer Services

OPPORTUNITIES FOR EXCELLENCE

ESTABLISHED PEST CONTROL COMPANY

NOW ACQUIRING

McCall Service is growing and we are interested in acquiring your established pest control business. It's a perfect time to sell, and there's no better team to join than ours.

NOW SEEKING Managers

- ▶ Comprehensive Compensation Plan that Includes Quarterly and Annual Bonus Opportunities
- ▶ Company Paid Insurance and Company Vehicle

Sales Professionals

- ▶ Salary Plus Commissions with Dedicated Support Staff
- ▶ Company Vehicle

Service Professionals

- ▶ Competitive Pay Plan with Paid Training
- ▶ Complete Benefits Package

For information on joining our growing family call *Bryan Cooksey*



(904) 301-0026
mccallservice.com



Visit us at
PestWorld 2016
in Seattle, WA.
(BOOTH # 543)



Physical Barriers to Pest Entry

- Sustainable pretreatment supplements
- Sustainable post-construction treatments
- Sustainable remodeling treatments

Contact us for information on becoming an **Approved Applicator**.
We have Pre-Construction / Post-Construction Treatments for pest exclusion.



TERM™ All Pest Bath Trap Barrier

TERM™ Sealant Barrier

TERM™ Particle Barrier



For product information, scan the
QR code image or visit our website:
www.InsectExclusion.com

Polyguard
Innovation based. Employee owned. Expect more.

Contact our entomologist:
Holly Beard, MS
Technical Sales, FL & GA
hbeard@polyguard.com
(561) 376-3543

CLASSIFIED ADS

BUSINESS FOR SALE

Firmly established Pest Control and Lawn Company for sale in Central Florida. \$500,000. Includes Building And Inventory.

For more information email:

CentralFLPC4Sale@gmail.com

Serious Inquiries Only

Pestcontrollicense.com

WE MATCH CERTIFIED OPERATORS AND BUSINESS OWNERS IN THE USA. NEED A PEST LICENSE? NEED AN OPERATOR? RETIRED, SOLD YOUR BUSINESS, LOOKING FOR EXTRA CASH?

Pestcontrollicense.com

Call for Information;
Allen (352) 443-1193



ACQUISITION EXPERTS LLC

THINKING ABOUT RETIRING
THINKING ABOUT SELLING

GHP Martin County SOLD \$145K
GHP L&O Coral Springs SOLD \$145K

Contact: John Brogan
Office: 772-220-4455 Cell: 772-284-4127
E-mail: john@acquisitionexperts.net
Visit our website at
www.acquisitionexperts.net
30 Years in the Pest Control Industry

PESTPRO
magazine is ONLINE at
pestpromagazine.com

YES, I HAVE THOUGHT ABOUT SELLING, BUT:

I am not sure about the selling price.
I don't know what I would do for a job.
I don't want to jeopardize employee's job(s).
If You have additional questions you would like answered.
Call, text, or email. No Obligation.

alwoodward@pestcontrolbiz.com
386-454-3333 (AL) A+ Business Brokers, Inc.

Heather Erskine, continued from Page 18

What kind of research were you doing with the bed bugs?

When I started in the lab, my research focused on the use of pesticide-impregnated sheets against bed bugs. I then moved onto testing a novel, passive bed bug interceptor trap designed by Dr. Koehler and Roberto. Like other interceptor traps, this one fit under the posts of a bed. This design, however, had a protective overhang that prevented dust or debris from collecting inside the trap. Instead of having to repowder the trap like other designs on the market, the slick interior surface would effectively prevent bed bug escape.

What are the perks of working in Dr. Koehler's lab?

Our lab is truly a bountiful resource where students can seize many skills and opportunities. There is no better place for a student to learn how to rear and maintain such a wide variety of insect colonies than this lab. We have houseflies, *Aedes aegypti* mosquitoes, two fruit fly species, 11 species of ants, two bed bug species, two termite species, 17 cockroach species, and a few other insects. Fortunately, I have been able to get my

feet wet with rearing several of these insect types. This is a skill I will probably never be able to obtain anywhere else!

Dr. Koehler has a great reputation for helping students cultivate a myriad of soft skills, too. I can attest to the fact that since I have been in his lab and have participated in many talks and conferences, my public speaking skills have improved.

There are also leadership advantages associated with the lab club, the Urban Entomological Society, such as service opportunities, and product design and development. For example, another student and myself collaborated to make an educational four-poster set for the pest management industry.

On top of all this, I cannot think of another program where students receive this level of exposure to the very industry where they hope to one day work. This is an attribute of the lab that I find to be extremely valuable. The students here are in a remarkable position to build great relationships with folks heavily involved in all areas of the pest control community.

Past students love to come to back and meet the current Koehler crew, tell stories, and give advice and insight regarding

opportunities. The networking potential here is huge. I feel lucky to be a part of this.

What are you working on in the lab?

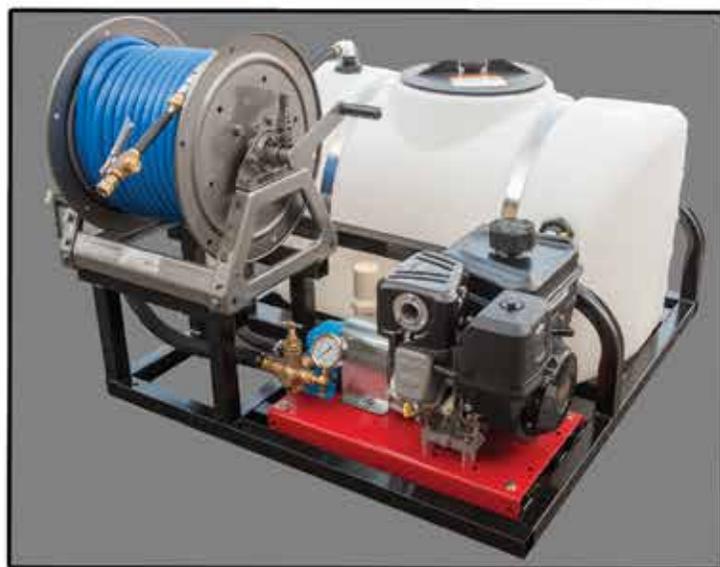
My research involves evaluating the interaction between silica and a polymer and their potential to enhance a formulation. I am doing a comprehensive study using different active ingredients in combination with different silica and polymer concentrations. I am conducting these experiments with eight different insect pests. I am interested in not only the immediate effects of the formulations, but also what the effects are after aging and weathering. My goal is to gain a better understanding of how these inert ingredients come together and effect an insecticide and how those effects may vary between pests.

What are your plans when you finish your degree at UF?

Find a job! After dedicating the past 20 years of my life to completing school, I am thrilled to finally start thinking about building a career. It has been an interesting and genuinely fortuitous journey that brought me here to the urban entomology realm. I have grown to love the pest control industry and truly look forward to becoming a working member. **PP**

OLDHAM

OLDHAM CHEMICALS COMPANY, INC.



*Let us
Build a Rig
to Meet
Your Needs*

www.OldhamChem.com
www.OldhamEquip.com

1-800-888-5502

THE BENEFITS KEEP GROWING. THE SAVINGS STILL LAST ALL YEAR.

The industry's only yearlong program just got better.
Learn more at PestPartners365.com



syngenta®

PROFESSIONAL PEST MANAGEMENT

FOR LIFE UNINTERRUPTED™

©2016 Syngenta. Important: Always read and follow label instructions. Some products may not be registered for sale or use in all states or counties and/or may have state-specific use requirements. Please check with your local extension service to ensure registration status and proper use. For Life Uninterrupted, PestPartners, the Alliance Frame, the Purpose Icon and the Syngenta logo are trademarks of a Syngenta Group Company. Syngenta Customer Center: 1-866-SYNGENT(A) (796-4368). MW 1LGP6039_BEN_AG65 07/16