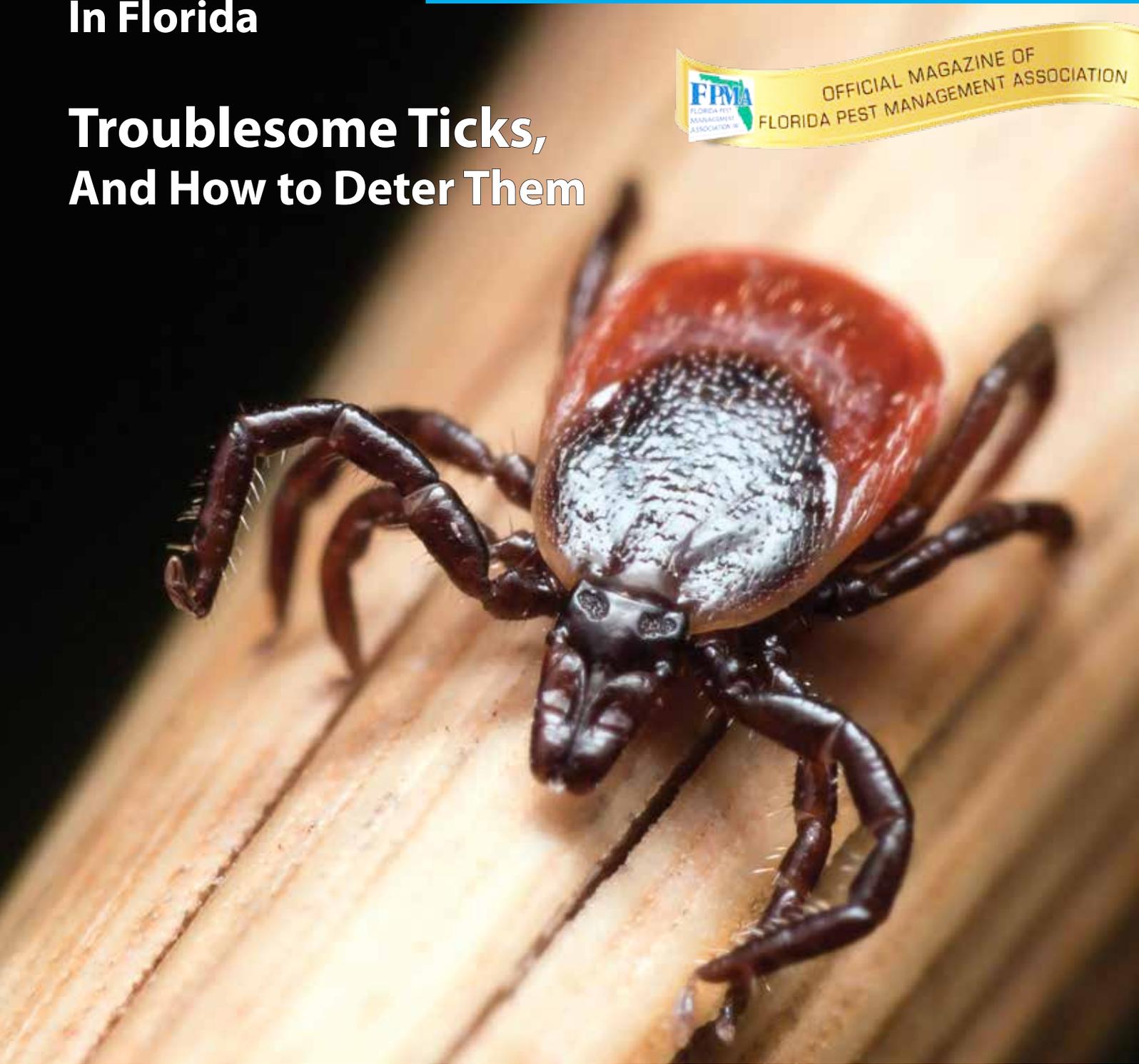


# PESTPRO

From Pest Management Education, Inc. to Landscape and Pest Managers

## The State Of Termite Activity In Florida

## Troublesome Ticks, And How to Deter Them



**19<sup>th</sup>**  
ANNUAL

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*the*  
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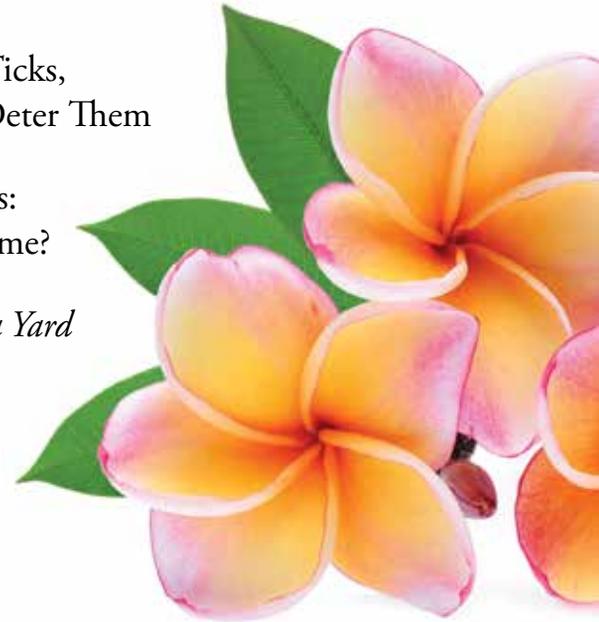
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## ON THE COVER

Closeup of blacklegged tick adult female. Also called deer tick, *Ixodes scapularis* is known to vector seven disease pathogens in humans, with no vaccines available yet. Pest pros can play an important role in protecting the public from these and all troublesome ticks.

*Photo by Steven Ellingson*



# FPMA Summer Conference: Fellowship Fuels Bright Ideas

*Message from the President of FPMA, Suzanne Graham*



**Elliot Zace and Dennis Castle**



**Suzanne Graham and Anne-Marie Tulp**



**Vicki McCrory**



**Roman Dycus, Steven Boudreaux and Steve Lum**

I'M JUST coming down from the "high" of this year's Summer Conference at the Hammock Beach Resort and Spa after seeing everybody so pumped to be together again. In just a few short days so many new ideas were brought up and tossed around for both EXPO and next year's Summer Conference!

We are always listening and observing at our events; watching what's working and what can be improved upon. We have been tweaking both events for the past two years so that future events are even more educational, informative, productive and fun! This year we even did surveys for attendees and vendors.

There are always lots of opinions and suggestions, some even conflicting, but the give-and-take that comes out of the dialogue generates some amazing ideas. You will see MANY of these ideas coming to fruition in the FPMA event schedule during the remainder of this year and on into 2023!

We are here, and we are listening! **PP**

*Suzanne Graham  
President, FPMA*



**Dinner al fresco**



**Kimberly Lastra and Rebecca Baldwin**



**Sheri Cunningham, Professional Women In Pest Management**



**CFO workshop**



Visit [flpma.org](http://flpma.org) for currently scheduled meetings and more.

# A New Era For Pest Management Associations

**P**ESTPRO magazine is proud to serve as the official magazine of the Florida Pest Management Association — FPMA, formerly the Florida Pest Control Association. We provide solid information from the University of Florida and look forward to continuing the magazine for a long time in the future.

The Florida Pest Control Association was formed at the UF campus in 1945, when Dr. John Creighton was the chair of the Entomology Department. He was frustrated that companies from the northern United States came to Florida in the winter, sold pest control contracts, and then abandoned their customers when pests emerged up north — therefore, they did not provide service for their Florida customers. He called the industry leaders together to discuss solutions. As a result, Chapter 482 of the Florida Statutes, which regulates pest control companies, was born. Since then the Florida Pest Management Association has grown, and the industry has flourished. Companies have come together, and competitors became friends and members of the association for the past 77 years.

## Associations Face Challenges

Although the association has survived many challenges, there are always new issues that affect the industry's ability to protect homeowners, businesses and properties from pests. Those challenges may include fertilizer restrictions, pesticide restrictions, and increased governmental regulations of business practices. It has always been FPMA and other associations that have stood behind the safe delivery of services to protect the public health and safety of people and buildings.

You would think, because of the need to challenge policies and laws that could negatively impact the industry, that every pest management professional would be a member of a pest control association. That is not the case. Every year the number shrinks of people that engage in dialogue with each other at association meetings to benefit the industry in general. Every pest control association is facing the same dilemma. What is the cause of this supposed indifference?

One cause may be the consolidation that is going on in the industry. Family firms are being bought in record numbers by large conglomerates that want to dominate the industry. It used to be that about 80 percent of the industry was composed of small business owners and about 20 percent by the large national and multinational corporations and franchises. Those small, family-owned businesses sent almost all their certified operators and branch managers to FPMA meetings. Now the balance has shifted, and a great part of the industry is dominated by large corporations.

These large corporations and franchises do their own lobbying in Congress and state legislatures. They do their own training programs internally to have a standard delivery of services. They do their own purchases of pest control equipment and products in bulk from the manufacturers, rather than from the distributors. They even do their own "research" to see which products fit into their specific business model. When it comes to attendance at pest control industry meetings, these large corporations send one or two representatives to participate and usually do not send their branch/regional managers to participate in the workings of FPMA. The days of pest control branch or regional managers and all certified operators attending a meeting and feeling a part of determining the future of the industry seem to be gone.

Additionally, pest control companies large and small are so busy taking care of customers that it is difficult for them to attend association meetings. All this adds up to an industry where each individual is so busy looking out for their part of the world rather than the industry as a whole.

People always have time for things that are important. So, we invite the entire industry to participate in a pest control association, so your ideas and interests are heard. This will assure that the industry can continue to grow and prosper. The urban pest control industry in Florida has a huge economic impact in the state. The recent survey has demonstrated an economic impact of \$2.7 billion per year. If the industry gave a unified voice for political challenges, the industry would have the brightest future.

## Reasons to Be Hopeful

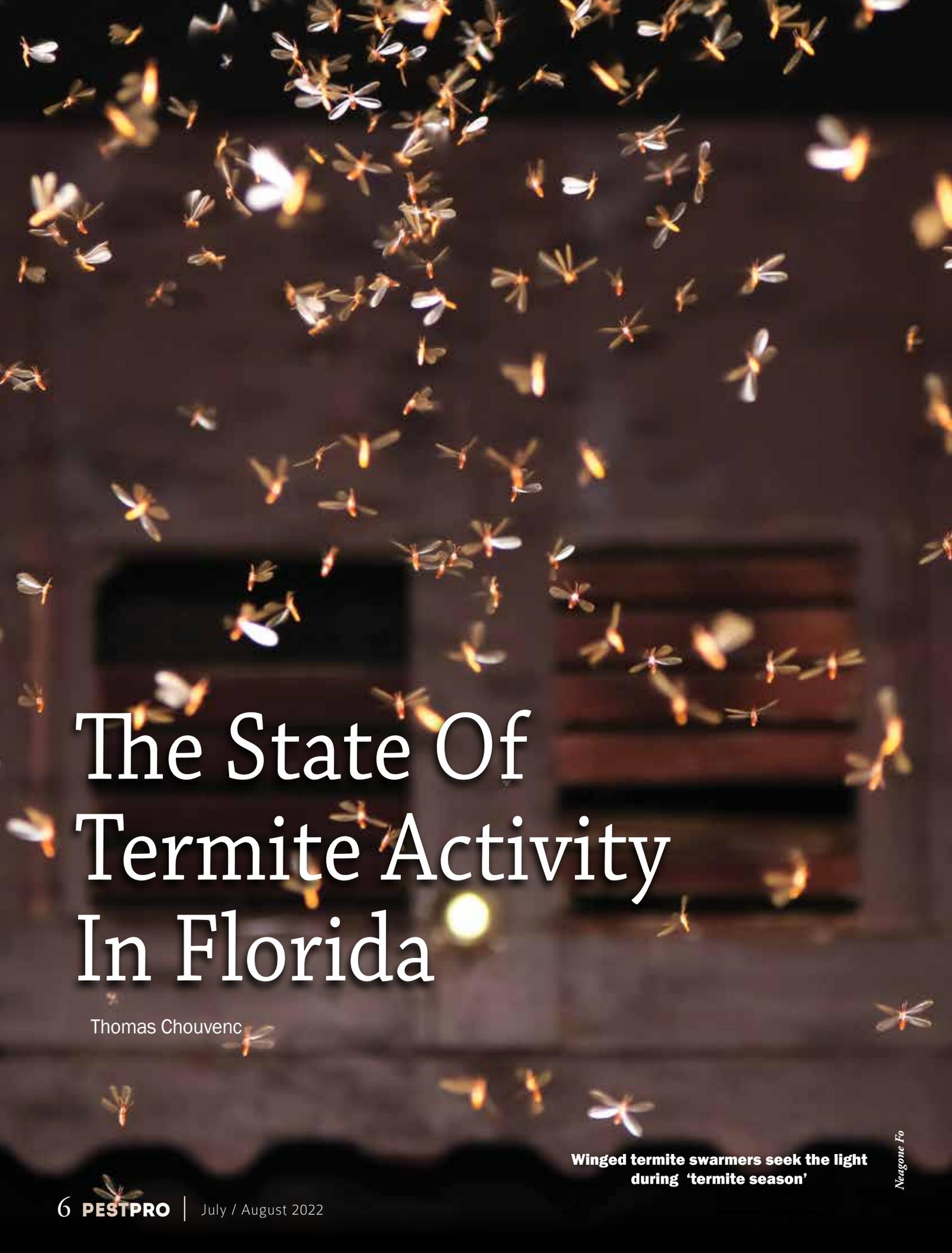
The FPMA political action committee has been extraordinarily effective in protecting the pest control industry in Florida. Sean Brantley and the committee have done an excellent job of positively portraying the benefits of responsible pest control. However, they are fighting the misuse of pesticides and fertilizers by poorly educated homeowners and unlicensed, untrained applicators throughout the state. As more people and pest control companies join, the voice of the industry will prevail.

That brings us back to memberships and participation in FPMA and other industry events throughout the state. Although registrations at these meetings are shrinking, the future is bright with the opening of the economy after the pandemic restrictions. We recently held the Southeast Pest Management Conference in Gainesville and had about 300 attendees. It was wonderful to see the enthusiasm and excitement of people getting together to plan the future of the industry. I encourage every pest control operator, whether working in a large or small firm, to stay informed and participate in associations and meetings sponsored by the University of Florida.

Also, *PestPro* magazine cuts across all the pest control corporations and businesses in Florida. We have brought the most recent technical, business and association events to about 12,000 pest control operators in Florida. We are proud of bringing current information and products to the entire pest management industry.

The associations do the same, and we hope that the communications within the industry will generate dialog and directed action. COVID and business consolidation of the industry have changed the pest control business environment, but we are looking forward to adapting to the new control business landscape. The future is bright if we all work together to improve the business of pest control. **PP**

— Dr. Philip Koehler,  
Managing Director, *PestPro*



# The State Of Termite Activity In Florida

Thomas Chouvenec

Winged termite swarms seek the light during 'termite season'



“IT’S ALWAYS termite season in Florida,” is a statement I made in *PestPro* back in May 2020. This is, unfortunately, the reality that many Floridians live in and which highlights the importance of the pest control industry in the state. Florida is the host of at least 20 established termite species, including five invasive species, with some of them taking a large bite out of our homes.

I have been studying termites here in Florida for 18 years now. As a biologist, I have spent extensive time looking at their behaviors, their dispersal flight events, their impact on homes and trees, and how they interact with us. However, I spent some time recently thinking about, “How do we interact with termites?” After all, we are also social animals, and we can pause a minute, looking at our own behaviors when dealing with termites.

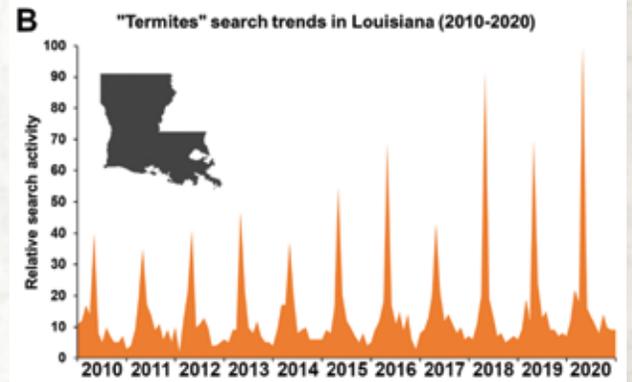
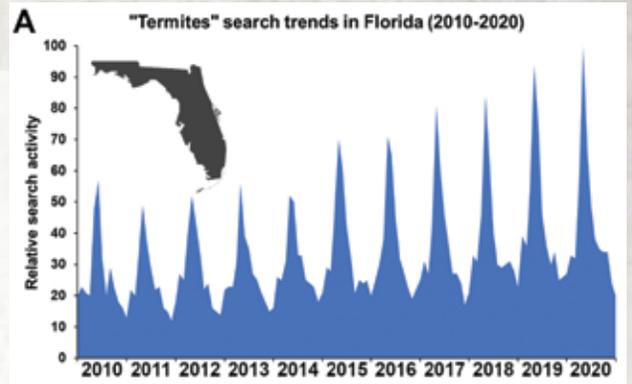
People tend to react emotionally — for valid reasons, most of the time — when termites are found in their home. Such reactions range from ignoring them, to spraying an entire can of pesticides, to sending samples for identification, to calling a pest control company to solve the problem. A lot of the work that we do as termite researchers, and that termite companies do, is fundamentally driven by the consumer.

Of course, as termites swarm, it is usually the time of year when they are most visible and tend to be reported. This “active” termite season means that it is crunch time for our urban entomology group at the University of Florida. We receive numerous termite samples for identification purposes, and we can provide recommendations. For termite professionals, this is when a significant portion of the booking for the rest of year will take place.

So while I stand by my statement that it is always termite season in Florida — they will chew your house year-round — it is also true that there are a few months of the year when their activity is particularly visible. Each termite species displays a dispersal flight at a different time of the year, but three of the primary pest species in the state tend to swarm in the spring, accentuating the perception that termites are more active in March–June. It is just that they have very visible dispersal events during their mating season.

### Google Trends

To compare how termite threats are perceived by the consumer in Florida, let’s look at how people ask questions about termites on the internet, and let’s compare it with the consumers from Louisiana, another state where termites are a big problem.



Graph 1. Relative internet search activity for “termites” between 2010 and 2020 by consumers in A) Florida, and B) Louisiana. The peaks occurred each year in May. Data source: Google Trends

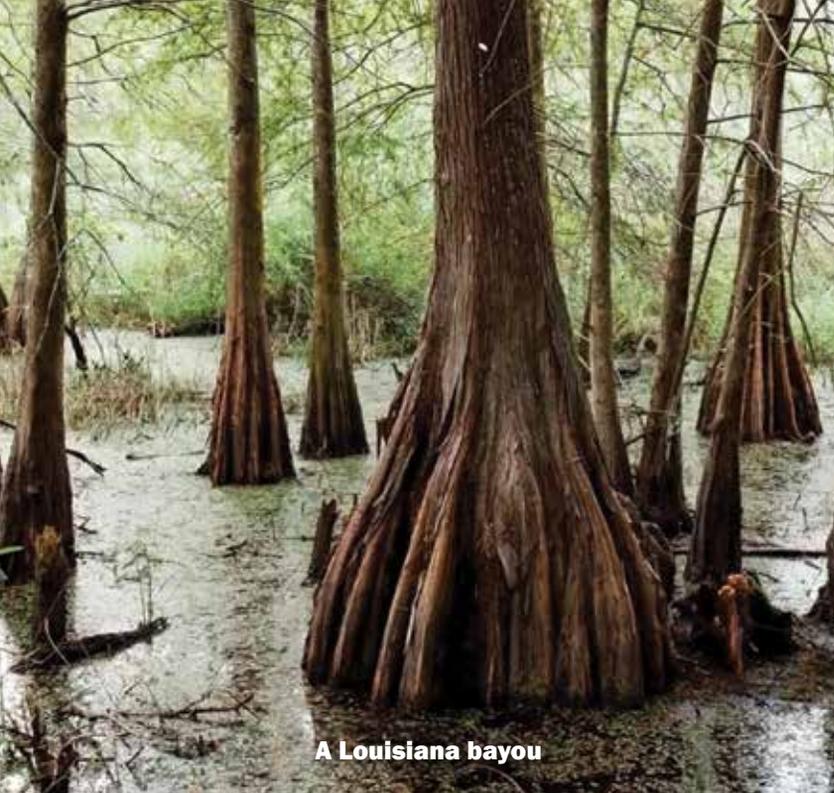
I looked at 10 years of search queries through Google, using the tools provided by Google Trends.

Both in Florida and Louisiana, consumers display a peak of online searches for “termites” in the month of May, with remarkable cycles of search activity every year from 2010–2020. We can also observe an upward trend of queries over the decade, but this could partially be due to the increased reliance of the consumer for readily doing internet searches on their smartphones.

However, it appears that there is a distinct difference in the behavior of consumers between the two states. In Louisiana, the peak of online search activity for “termites” is sharp and rapidly goes back to a baseline. In comparison, in Florida the baseline is much higher, and the peak of online search activity is stretched over time.

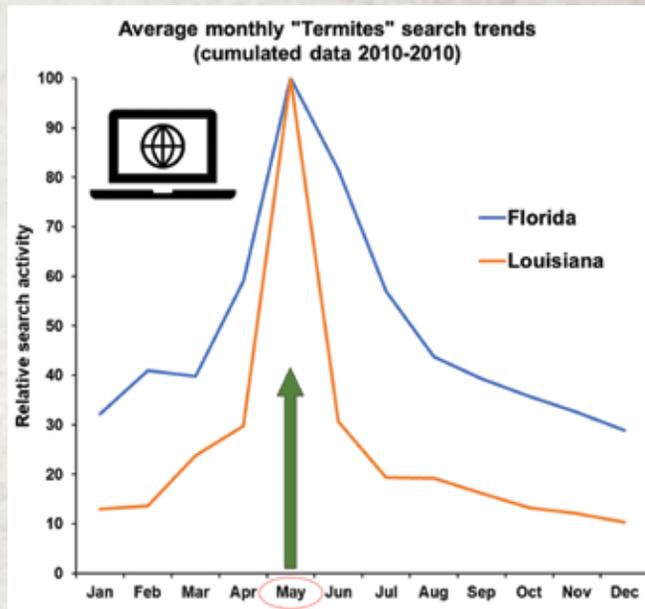
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A Louisiana bayou

Carol M. Highsmith



Graph 2: Average monthly search activity in 2010–2020 for “termites” in Florida and Louisiana (Source data: Google Trends).

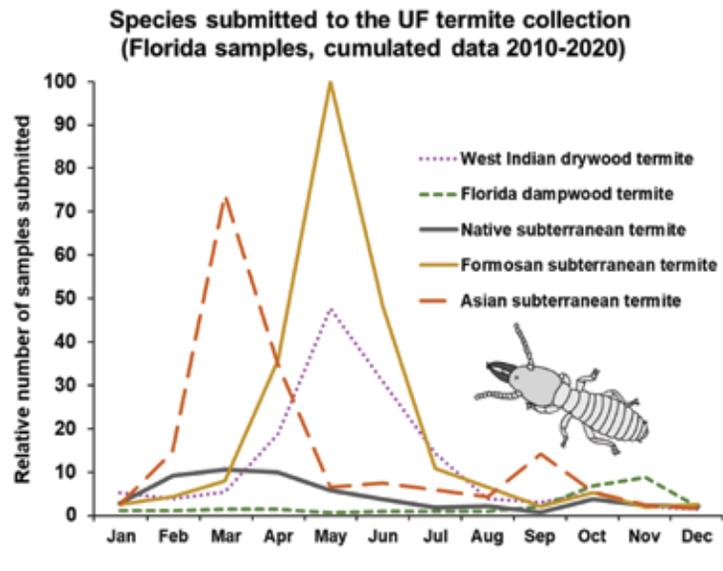


Formosan termite colony

Scott Bauer, USDA

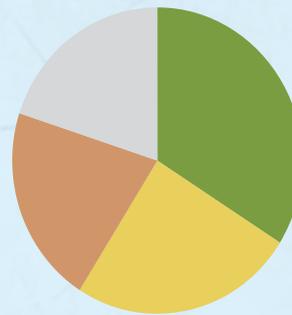
**B**Y CALCULATING the average monthly online search activity for “termites” over the past 10 years, it quickly becomes obvious that the nature of the termite problem between the two states is different and is reflected in consumer behaviors (Graph 2). In Louisiana, 33 percent of all yearly queries are made in the month of May. By comparison, in Florida only 17 percent of all yearly queries are made in the month of May, because the search activity is spread across many months.

In Louisiana the peak of activity of searches for “termites” primarily corresponds to the dispersal flight events of the Formosan subterranean termite, *Coptotermes formosanus*, which is the most problematic termite species in this state. In Florida, the Formosan subterranean termite is also problematic, but its relevance and importance are diluted by the presence of many other termite species that can be found in people’s homes (Graph 3). In addition, the latitudinal gradient of the Florida peninsula implies a climate gradient, spreading the swarming season of each species over time, with early swarms in South Florida. These two factors primarily explain the difference in public termite perception between the two states.



Graph 3. Relative number of termite samples submitted to the University of Florida Termite Collection (UFTC) per species, with a focus on the most reported termite species.

### Termite species reported in Florida



- Formosan sub termite 34%
- Asian sub termite 25%
- West Indian drywood termite 21%
- Other termites 20%

Graph 4. Top-reported termite species in Florida.

### UF Termite Collection

I also investigated the 2010–2020 records of the University of Florida Termite Collection, or UFTC. Approximately 3,000 termite samples were provided during that time frame, and 92 percent of all samples belonged to seven termite species (out of 20). The three top-reported termite species in Florida were the Formosan subterranean termite (34 percent of all termite samples submitted), the Asian subterranean termite, *Coptotermes gestroi*, (25 percent of all termite samples submitted), and the West Indian drywood termite, *Cryptotermes brevis*, (21 percent of all termite samples submitted). Most of the specimens we received were alates, confirming that their detection is often made during swarming events.

These three species represent some of the most economically important termite species in the state of Florida. After these three species, four other significant termite species were, to a lesser degree, also reported to the UFTC: native subterranean termites *Reticulitermes flavipes* and *Reticulitermes virginicus*,

and Florida dampwood termites *Neotermes castaneus* and *Neotermes jouteli*.

There is, however, a discrepancy between the report of *Reticulitermes* sp. to the UFTC and their actual economic importance. Native subterranean termites remain a primary structural pest in many parts of Florida, but because their dispersal flights occur midday, they tend not to show up inside houses. For all other species, they fly at sunset, which means that they tend to be attracted to lights and eventually be reported.

To support this observation, most *Reticulitermes* samples in the UFTC are workers and soldiers, reported throughout the year from local infestations. This observation is important, because it highlights that perception is sometimes disconnected to their actual pest status, which primarily depends on the time of the day they swarm.

### Is it Always Termite Season in Florida?

To conclude, in Louisiana the perception of termite activity is primarily driven by the large swarms of a single pest species:

Formosan subterranean termites. In Florida, each pest or nuisance termite species displays a distinct dispersal flight season across the year, with some degree of overlapping. It results in a far less defined “termite season,” as experienced by consumers.

The difference of consumer reaction between the two states highlights how the situation in Florida differs from most other southern states. The Florida north–south latitudinal gradient, with a tropical climate in South Florida, allows for various species to thrive. It eventually reflects how it leads people to perceive termite threats and to do online queries about termites.

So, yes. It is always termite season in Florida, after all. **PP**

*Thomas Chouvenec is Assistant Professor in urban entomology specializing in biology, ecology, evolution and control of termites at UF/IFAS Ft. Lauderdale Research and Education Center.*

The Florida Everglades

# University of Florida Bee College Returns to Panhandle

PANAMA CITY will be abuzz with bee enthusiasts when the University of Florida's Bee College returns to the Florida Panhandle this summer.

The two-day educational experience for beginner to advanced beekeepers will be at the Florida State University Panama City campus Aug. 12–13. Tickets are on sale at [tinyurl.com/PanhandleBeeCollege](http://tinyurl.com/PanhandleBeeCollege).

The program marks a return to normal for the UF/IFAS Honey Bee Research and Extension Laboratory, which hosts Bee College twice each year: an annual course at its home campus in Gainesville and alternating years in either the Panhandle or South Florida. The traveling program was replaced with virtual Bee College since 2020.

“We are excited to bring this educational opportunity directly to beekeepers in the Panhandle once again,” said Amy Vu, UF/IFAS Extension state specialized program agent for the HBREL.

Bee College attendees — whether beginners or experienced beekeepers — can choose the lectures and demonstrations that most interest them. Expert talks will include topics from bee biology to common diseases, while hands-on activities will include building equipment and hive management. Attendees are also invited to enter the Honey Show, in which certified judges will critique and award the best in honey, mead, candles, bee-themed art and more.

**WHAT:** Panhandle Bee College 2022

**WHO:** Beginner to advanced beekeepers welcome. Expertise will be provided by faculty and staff from the UF/IFAS Honey Bee Research and Extension Laboratory, housed in the No. 1-ranked entomology and nematology program in the world, plus UF/IFAS county Extension agents in the Panhandle and partners like the Florida Department of Agriculture and Consumer Services.

**WHEN:** Aug. 12 and 13. Doors open at 8 AM.

**WHERE:** Florida State University Panama City campus, 4750 Collegiate Dr.

**COST:** \$200 for two-day admission, \$140 for one-day.

Bee clubs may also purchase one \$160, two-day ticket for raffling purposes.

A discounted rate is available for active-duty military members; retired veterans; Florida State Beekeepers Association members; active members of the UF/IFAS Master Beekeeper, Master Gardener or Master Naturalist programs; 4-H Members; UF/IFAS county Extension faculty; and anyone under 18 years of age.

**REGISTRATION AND MORE INFORMATION:** [tinyurl.com/PanhandleBeeCollege](http://tinyurl.com/PanhandleBeeCollege). **PP**

*By Kirsten Romaguera  
UF/IFAS*

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# Troublesome Ticks, And How to Deter Them

Centers for Disease Control

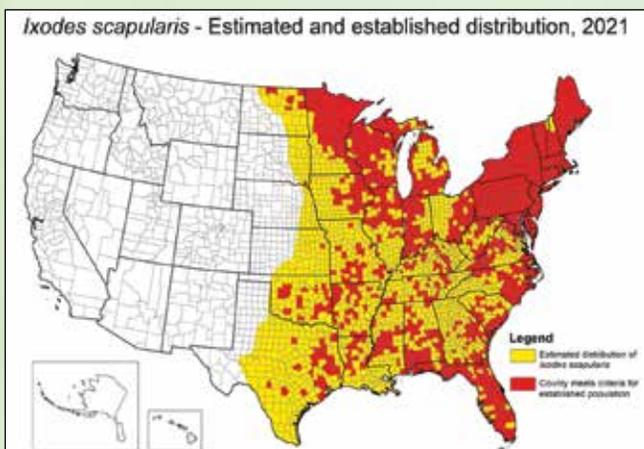


OF THE MANY tick species found throughout the world, only a select few bite and transmit disease to people. Of the ticks that bite people, different species of ticks transmit different diseases. The five ticks in this article are the most common disease-vectoring ticks in Florida.



Adult ticks are the easiest to identify, and male and female ticks of the same species may look different. Nymphal and larval ticks are very small and may be hard to identify. CDC

AT TOP: Use fine-tipped tweezers to remove a tick as soon as possible. CDC



Map: Estimated distribution of areas where the blacklegged tick (*Ixodes scapularis*) could survive and reproduce (yellow), and counties where established populations have been documented (red). Counties classified as “established” are those where six or more *I. scapularis* of a single life stage or more than one life stage of the tick were collected in the county within any 12-month period. Counties not classified as established should not be interpreted as the tick being absent. ArboNET / CDC



Jim Gathany, CDC

Blacklegged tick, *Ixodes scapularis*

**Where found** Widely distributed across the eastern United States.

**Transmits** *Borrelia burgdorferi* and *B. mayonii*, which cause Lyme disease; *Anaplasma phagocytophilum* (anaplasmosis); *B. miyamotoi* disease (a form of relapsing fever); *Ehrlichia muris eauclairensis* (ehrlichiosis); *Babesia microti* (babesiosis); and Powassan virus (Powassan virus disease).

**Comments** The greatest risk of being bitten exists in the spring, summer and fall. However, adults may be out searching for a host any time winter temperatures are above freezing. All life stages bite humans, but nymphs and adult females are most commonly found on people.

**Seasonal abundance**

**Larvae and Nymphs:** April–August

**Adults:** September–May

Continued



American dog tick, *Dermacentor variabilis*

**Where found** Widely distributed east of the Rocky Mountains. Also occurs in limited areas on the Pacific Coast.

**Transmits** Tularemia and Rocky Mountain spotted fever.

**Comments** The highest risk of being bitten occurs during spring and summer. Adult females are most likely to bite humans. Sometimes called wood tick.

**Seasonal abundance**

**Larvae:** July–February

**Nymphs:** January–March

**Adults:** March–September



Brown dog tick, *Rhipicephalus sanguineus*

**Where found** Worldwide.

**Transmits** Rocky Mountain spotted fever (in the southwestern United States and along the U.S.–Mexico border).

**Comments** Dogs are the primary host for the brown dog tick in each of its life stages, but the tick may also bite humans or other mammals.

**Seasonal abundance**

In Florida, the life cycle can occur year-round both inside residences and in outdoor kennels and dog runs.



Gulf Coast tick, *Amblyomma maculatum*

**Where found** Coastal areas of the United States along the Atlantic coast and the Gulf of Mexico.

**Transmits** *Rickettsia parkeri* rickettsiosis, a form of spotted fever.

**Comments** Larvae and nymphs feed on birds and small rodents, while adult ticks feed on deer and other wildlife. Adult ticks have been associated with transmission of *R. parkeri* to humans.

**Seasonal abundance**

**Nymphs:** February–August

**Adults:** March–November



*Note: These maps show the general distribution of selected human-biting ticks in the United States. Populations of ticks may be found outside the shaded areas. CDC*



Lone star tick, *Amblyomma americanum*

**Where found** Widely distributed in the southeastern and eastern United States.

**Transmits** *Ehrlichia chaffeensis* and *Ehrlichia ewingii*, which cause human ehrlichiosis; Heartland virus; tularemia; and STARI.

**Comments** Aggressive tick that bites humans. The adult female has a white dot on her back. Lone star tick saliva can be irritating; redness and discomfort at a bite site do not necessarily indicate infection. Nymphs and adult females most frequently bite humans and transmit disease.

**Seasonal abundance**

**Larvae:** June–November

**Nymphs:** February–October

**Adults:** April–August (peak in July)



*Continued on Page 20*



Conehead termite



Syngonium



Conehead termite nest

# What's In a Name? Erin Harlow



**Invasive species:**  
An organism that is nonnative to the ecosystem and whose introduction causes or is likely to cause harm to the economy, environment, and/or human health.

**Y**OU HAVE probably heard of Florida's invasive species such as conehead termites, lionfish, Brazilian pepper tree, Cuban tree frogs, or ball pythons. *PestPro* even highlighted the python challenge in the July/August 2021 edition. But what about the New Guinea flatworm, skunkvine, or syngonium? All of these organisms are considered invasive in the state of Florida. Florida has over 500 introduced species, according to the Fish and Wildlife Conservation Commission.

With so many introduced species, it can be difficult to convey a correct and consistent message about these organisms throughout the industry. Seeing a need to streamline the verbiage and provide professionals with cohesive terminology, the UF/IFAS Invasive Species Council

created seven standardized words for describing species in Florida to help better educate stakeholders.

The seven terms professionals should use when describing plants, invertebrates, vertebrates or pathogens are: **native, nonnative, introduced, established, invasive, nuisance** and **range change**. Below is a quick description of each.

### Native

A native species is one that was recorded or thought to be in North America prior to the European settlement. Within the range or location being considered, the species would have evolved in that area to be native. To designate something native, both the geography and the amount of time it has been in a location should be considered.

### Nonnative

Species that are considered nonnative, are those that did not evolve in a designated area. It should be noted that just because a species is classified as nonnative, it does not mean that it is causing economic or environmental harm. There are many species of ornamental plants that are nonnative but used in the landscape.

### Introduced

If a species is "introduced" then it would imply that it did not evolve in that location but was somehow brought to the area. This introduction could have been intentional or unintentional. As with the term "nonnative," it does not indicate if the species is harmful, but rather communicates how it came to a certain geographic area.

*Continued*

THE TERM “introduced” can refer to both native and nonnative species. For instance, if a native species was moved or relocated to an area within its native range that was previously unoccupied, then it is an introduced native.

### Established

A species may be deemed “established” if it is reproducing and moving into new areas without the help of humans. The important point with the term “established” is that the population is growing on its own. Again, it does not necessarily mean that it is causing economic or environmental harm.

### Invasive

For a species to be considered invasive, it must meet three criteria. It must be nonnative to the area, must have been

introduced and is likely to cause environmental or economic, and/or harm to humans. It is helpful for species that do cause harm and meet these criteria to be labeled as invasive because they then are prioritized differently for management purposes.

Labeling a species as “invasive” can be a very complex situation. Many factors such as range changes, a lag time before a species becomes invasive, shifting ranges, and even climate play a role.

### Nuisance

Nuisance species are especially interesting and can be confusing for clientele. For plants, this term refers to species that are native to a particular area but may be causing harm. Plant species that fall into this category that are common include poison ivy, Virginia creeper, and greenbrier.

*Continued on Page 24*



Common greenbrier

Ashley Bradford



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# Flip My Florida Yard

Carrie Stevenson



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<https://www.flipmyfloridayard.com/>

Carrie Stevenson, UF/IFAS Extension

Libbie Johnson, UF/IFAS Extension



WORKING in Extension has given me a lot of interesting opportunities. On the job, I've found myself leading kayak trips all over Florida, building a two-story bat house, and wearing a Mr. Peanut costume while talking about agriculture. But I never really imagined being featured on a home improvement reality TV show.

Sure, I've watched my fair share of *Extreme Makeover: Home Edition* and *Love It or List It*, but those were just entertaining ways to pass the time and maybe get some ideas for my own house.

Then, a few months ago our office was contacted by the producers of a show called *Flip My Florida Yard*, to inform us they would be in Escambia County to film an episode of the show for the Discover Florida channel. As part of the effort, they'd need a local Extension agent to go on a site visit, help review the landscape design, and talk about Florida friendly landscaping principles on air.

Based on my prior experience as a Florida Yards & Neighborhoods agent — and our horticulture agent being swamped with Master Gardener training — I got the reality TV job.

*Continued on Page 22*



family

PESTU

**Mom Pat Hottel with Ben at 2021 Pest World in Las Vegas**

# Ben Hottel



*pest control tradition wins the day!*

I RECENTLY saw this joke online: *An entomologist is sitting down to a meal with his family. When a beetle runs across the table, he yells, "Quick, carabid!"*

If you laughed at that joke as I did, you might be an entomologist.

Entomologists are a rare profession — the Entomological Society of America reports just over 7,000 members. If we look even further at those members that are board-certified entomologists in urban/structural entomology, we get 289 individuals. This is especially small when looking at lawyers and physicians, which each have over a million individuals in their ranks just in the United States. It is no wonder then that it commonly surprises people when I tell them I am an entomologist and work in the pest control industry for a living.

A common follow-up question is, "Why did you decide to go into this field?" I typically say, "Genetics, and I had no choice in the matter." These bad inside jokes that might be funny to me don't go over well with strangers, and I usually end up having to give some more details. The short story is that I grew up in the pest control industry and my mom, Pat Hottel, is an entomologist.

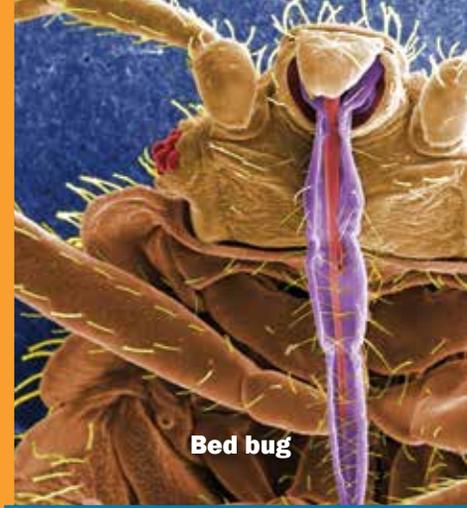
For those of us that have done outreach events for local elementary schools, it is interesting to observe that younger children seem to be fearless and super-interested in insects. They will hold hissing cockroaches or tarantulas, be amazed by insect collections, and ask tons of questions.

Then you get a range of parents who have the opposite response and are scared of everything you have on the table. I guess this is good news for us in the pest control industry for having some job security.

My mom, on the other hand, has been an entomologist for the pest control company McCloud Services for over 40 years. She was the opposite of these parents and was the one bringing the tarantulas and hissing cockroaches to the elementary schools.

As you can imagine, my childhood was a little bit different from most. I would get involved with the McCloud Bug Club at her work that would pay kids a half dollar coin for each insect specimen they caught and turned in. I thought I was going to make a lot of money off bugs with my excellent skills in catching stinging insects and dragonflies. Little did I know that I would make a career out of killing/trapping insects decades later.

**As a doctoral student, Ben got to focus on bedbugs at the UF Urban Entomology Lab**



**Dr. Ben Hottel**

**Ben Begins His College Career**

While growing up, I would also get taken to meetings of the Entomological Society of America and National Pest Control Association. As a teenager, though, I think there is some level of resistance to doing things that your parents think are “cool,” and I decided I was more interested in business than insects.

I was an agricultural economics major at the University of Illinois. Halfway through, after doing an internship at Archer Daniels Midland, I decided that I was in the wrong field. I couldn't see myself being in an office the rest of my life and wanted to do something where I could get out and about. I really had enjoyed some of the crop science, biology and even one entomology course I took.

I decided to do my senior research project on the economic effects of honey bee colony collapse disorder. I argued in that paper that while honey bees are important pollinators, there is only really one crop that requires their pollination 100 percent, and that is almonds. In addition, the economic effects of honey bee population declines are less than what you would think since many other pollinators can pollinate these crops as well.

After graduating with my bachelor of science in agricultural economics in 2009, I applied for an master of science entomology position at a few different schools. I got into the University of Illinois entomology program in Dr. Sue Ratcliffe's lab.

I was doing somewhat of a career change into a field

in biology, and I was a bit intimidated. We would have weekly departmental guest lectures, and I remember the first few I attended I had no idea what was going on. By the end of my degree I was able to understand most of what people were discussing, so I must have had some excellent teachers who were able to bring me up to speed.

For my M.S. research project, Dr. Ratcliffe gave me a lot of flexibility in what I could do my research on. I talked to my mom about some pests she thought would be good to get more information on that would help the pest control industry. One of the pests was bed bugs, which was a hot topic in 2009. This was at the peak of their reemergence, and people were still trying to figure out how to control them. It

*Continued*



**Dr. Sue Ratcliffe**





**UF bed bug research boomed  
in the new millenium**

turned out it was going to be a risky pest to work on since I didn't have any established colonies of bed bugs in the lab or any good field sites in central Illinois I could do research projects on as a master's student.

I ended up doing my research on dark-eyed fruit flies, *Drosophila repleta*, which can be major pests in restaurants, bars, hospitals and even animal facilities. There was very little research that has been done on these flies. To this day there still is very little that has been examined.

My research looked at the use of volatile and color attraction for trapping these pests to monitor for their activity. There was a swine facility on campus that was experiencing a very bad outbreak of these flies. It was the perfect field site do research, since there were so many flies present. I found that alcoholic products such as wine were the most attractive volatiles and that visual attraction did not play a very significant role in trapping these flies.

**UF Urban Lab, and – BED BUGS!**

After graduating from the University of Illinois in 2011, I still wanted to work on bed bugs, and Dr. Phil Koehler's lab at the University of Florida had an opening. There were some rumors floating around that this professor really didn't like cats, which at the time I felt was a little ... odd ... but I really wanted to work on bed bugs, so I figured I would give it a go.

Phil Koehler's lab had many more people in it than my previous lab and it was a nice change of pace. While the University of Illinois gave me a lot of exposure and insights into the academic world of entomology, the University of Florida opened more experiences in the pest control industry. I was able to get involved in more events at local and national pest control associations.

My research on bed bugs was also very exciting to conduct. I ended up focusing my research projects on novel ways that surface characteristics on traps or in the environment affect bed bug behavior and how we can use that change in behavior to our benefit. Usually this change in behavior was for trapping and monitoring purposes. This ranged from showing the importance of smooth surfaces and talc powder applications on pit fall trap design to creating new, innovating traps with other labs in the UF Material Sciences and Engineering Department.

*Continued on Page 30*

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# Risky Business

Allen Fugler

## Workers' Comp Goes High Tech

A RECENT STUDY analyzed more than 1.5 million workers compensation claims over a five-year period, 2015–2019, and revealed that 35 percent of injuries occur during employees' first year on the job, regardless of age or industry experience.

The most common causes of first-year injuries were overexertion (27% of all claims); slips, trips and falls (22%); being struck by an object (14%); cuts and punctures (6%); being caught in or between objects (6%); and motor vehicle accidents (6%). First-year injuries resulted in more than six million lost workdays over the five-year period studied.

Technological innovations are presenting solutions to improve employee safety and lower the rate and severity of injuries. Wearable "tech" provides multiple workplace safety benefits: preventing injuries by changing behavior, revealing workplace risks so owners direct attention to areas that are more injury prone. Sensors can detect unsafe movements such as improper ergonomics and provide real-time alerts to help coach better body positions. They can heighten awareness of high-risk movements performed on the job, such as moving in attic and crawl spaces, lifting backpack sprayers, and treating while walking.

When provided with real-time coaching, technicians can self-correct and change their behavior, reducing the number of times they perform movements that can lead to injury.

Hearing aids can even be considered wearable technology, since they extend the auditory senses and can create safer and more productive environments for the wearer. Other examples of wearable technology include:

- Smart jewelry, such as smart rings, wristbands and watches
- Body-mounted sensors and cameras
- Augmented reality (AR) and virtual reality (VR) headsets with mounted cameras to record inspections

### Tech-Driven Strategy

The reduction of high-risk movements among a workforce serves as a leading indicator that injuries will go down, because unsafe body mechanics often lead to injury.

Over time, injury rates start to decrease, following the reduction in high-risk movements. And because safety wearables are reducing sprain-and-strain injuries — which can take a long time to recover from — there's also a reduction in lost or modified workdays.

Insurance carriers are just starting to consider underwriting requirements for workers' comp that utilize technological innovations like wearables. Traditionally, workers' comp insurance has been transactional — an injury occurs, it leads to a claim, and the carrier manages and pays for that claim. This approach hasn't been altered in many decades.

A tech-driven workers' comp strategy can be proactive and preventive if a carrier provides the policyholder with safety tech that helps reduce injuries. This leads to less claims and ultimately a lower experience modifier and lower premium for the employer. Data aggregated over time enables better claims prediction for risk evaluation. It shifts the entire process from a transactional transfer of risk to one of preventive risk management, all while bettering technician safety and company productivity.

### The Future of Employee Safety

Tech-driven, preventive risk management seems to be the future of workers' comp insurance, much like telematics in vehicles is playing an increasingly larger role in fleet management and claims reduction. Technologies can help address labor shortages by preventing "down time" created by injuries. Tech-enabled workers' comp offers pest control companies new opportunities to grow their businesses, improve worker safety, and lower claims

connected with their workforce on a new, more personal level. Overall health and fitness can be improved as part of a comprehensive partnership program, while protecting personal medical information.

Wearable devices can already measure biometrics to provide individuals with information about their body and lifestyle, from the number of steps they take in a day and calories burned, to their heart rate and quality of sleep. They can play roles in personal fitness programs while providing real-time alerts of potentially life-threatening events like falls, auto accidents, cardiac arrhythmia, blood pressure and blood sugar spikes, heat-related stresses, and even dog bite attacks.

Properly implemented, these devices can protect a company's most important assets — their employees — while guarding the medical privacy of technicians in the field. **PP**

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*Allen Fugler is Director of Risk Management for Xterminator Pro, a Division of Aegis General Insurance. He is a frequent speaker at industry meetings and contributor to trade publications; he works with insureds on regulatory compliance, employee training, file documentation and risk mitigation. His 29-year career in pest management began in 1991 and includes stints in pest trade association management and with insurance programs dedicated to pest management professionals. He is a credential pest professional who also holds an OSHA certification. Loss-control resources can be found in the "Client Area" of the Xterminator Pro website ([www.aegisgeneral.com/products/xterminator-pro/losscontrol](http://www.aegisgeneral.com/products/xterminator-pro/losscontrol)). He can be reached at [afugler@xterminatorpro.com](mailto:afugler@xterminatorpro.com) or (407) 241-3037.*



*Ticks, continued from Page 12*

Ticks are generally found near the ground, in brushy or wooded areas. They can't jump or fly. Instead, they climb tall grasses or shrubs and wait for a potential host to brush against them. When this happens, they climb onto the host and seek a site for attachment.

**Applying Pesticides Outdoors to Control Ticks**

Use of pesticides can reduce the number of ticks in treated areas of your yard. However, you should not rely on spraying to reduce your risk of infection.

When using pesticides, always follow label instructions. Before spraying, check with local health or agricultural officials about:

- The best time to apply pesticide in your area
- The best type of pesticide to use
- Rules and regulations regarding pesticide application on residential properties

**Create a Tick-Safe Zone to Reduce Ticks in the Yard**

Here are some simple landscaping techniques that can help reduce tick populations:

- Remove leaf litter.
- Clear tall grasses and brush around homes and at the edge of lawns.
- Place a 3-foot-wide barrier of wood chips or gravel between lawns and wooded areas to restrict tick migration into recreational areas.
- Mow the lawn frequently.
- Stack wood neatly and in a dry area (discourages rodents).
- Keep playground equipment, decks, and patios away from yard edges and trees.
- Discourage unwelcome animals (such as deer, raccoons, and stray dogs) from entering your yard by constructing fences.
- Remove old furniture, mattresses, or trash from the yard that may give ticks a place to hide.

**Tick Bites / Prevention**

1. Use Environmental Protection Agency (EPA)-registered insect repellents containing DEET, picaridin, IR3535, oil of lemon eucalyptus, para-menthane-diol, or 2-undecanone. Treat clothing and gear, such as boots, pants, socks and tents with products containing 0.5% permethrin. Additional repellent options are available. EPA's repellent search tool External can help find the product that



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John Keogh



Hammerhead flatworm, closeup of head



Hammerhead flatworm, at right, preying on an earthworm



This bit of a hammerhead flatworm will develop into a full worm within weeks!

Photo at left by Scott Loarie, photos at right by Pierre Gros

best suits your needs.

2. Treat dogs and cats for ticks as recommended by a veterinarian.
3. Check for ticks daily, especially under the arms, in and around the ears, inside the belly button, behind the knees, between the legs, around the waist, and on the hairline and scalp.
4. Shower soon after being outdoors.
5. Learn more about landscaping techniques that can help reduce blacklegged tick populations in the yard.

### Tick Removal

1. Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible. The key is to remove the tick as soon as possible. Avoid folklore remedies such as using nail polish, petroleum jelly, or heat to make the tick detach from the skin.
2. Pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouthparts to break off and remain in the skin. If this happens, remove the mouthparts with clean tweezers. If you are unable to remove the mouth parts easily, leave them alone and let the skin heal.
3. After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water. **PP**

## Hammerhead Flatworm

Guest Detective Carrie Stevenson

**WE ALL KNOW** about the fascinating hammerhead shark, with its wide, unusually shaped head, but did you know there may be a different kind of hammerhead lurking in your backyard? Long and skinny, invasive and exotic, the hammerhead flatworm, *Bipalium kewense*, is a land planarian that has wriggled its way into Florida's soils.

If you ever experimented with planarians in biology class, you may recall that if they are cut into pieces, they can regenerate into new planarians—growing new heads, tails, or even both! One study even showed that a planarian piece 1/279th the size of the original worm could grow into a full organism in a matter of weeks. With this adaptability, it is no wonder they have survived and reproduced in our area.

The hammerhead flatworm is a carnivore and uses its muscular, snakelike body to chase down and capture native earthworms. Once subdued, the hammerhead worm uses a sticky secretion full of neurotoxins to kill its prey.

Hammerhead flatworms can grow to a length of 11 inches, and their bodies are generally a light brown with a black stripe down the length. Native to tropical forests of southeast Asia, they thrive in high humidity and the moist soil found under shrubs, leaf litter, and logs. Like other worms, they may surface after heavy rains.

The worms arrived in the United States more than a century ago with the horticulture trade, but only recently have I gotten questions about them from locals. Being invasive exotic species, it is recommended that the flatworms be removed and killed when found, to reduce predation on native worms. Salt and citrus essence are effective methods—just don't cut them up! **PP**

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*Carrie Stevenson is Coastal Sustainability Agent for the UF/IFAS Escambia County Extension Office, and has been with the organization since 2003.*

Article adapted from CDC online, "Ticks," <https://www.cdc.gov/ticks/index.html>.



*Flip My Yard, continued from Page 15*

Florida-Friendly landscapes use water and fertilizer appropriately, include wildlife-friendly vegetation, and reduce stormwater runoff.

According to UF/IFAS Extension, the nine principles of Florida-Friendly Landscaping are:

1. Right plant, right place
2. Water efficiently
3. Fertilize appropriately
4. Mulch
5. Attract wildlife
6. Manage yard pests responsibly
7. Recycle yard waste
8. Reduce stormwater runoff
9. Protect the waterfront

**P**ART EDUCATION and part entertainment, the show's premise is similar to most home remodeling shows. A couple or family wishing to improve their current home shares their hopes with the remodelers, the homeowners are sent away for a day, and upon their return they are surprised with a brand-new look.

The twist with *Flip My Florida Yard* is that the landscapes in need of improvement are redesigned with Florida-friendly principles in mind. During each episode, Extension agents, IFAS researchers, and landscape designers are interviewed about concepts like using mulch and compost, proper irrigation, or "right plant, right place" choices based on soil type and sunlight availability.

Season 1, the crew was in Panama City to help a family restore their yard after damage from Hurricane Michael. For our Escambia County program, we will focus on appropriate fertilization, managing stormwater, protecting the waterfront, and providing wildlife habitat.

This afternoon, I will do an interview with the show's producers, and tomorrow we will spend all day renovating a local backyard. In the meantime, all the past episodes are available for viewing on the Discover Florida Channel. The channel can be accessed via a free online account, or through several streaming services like Roku, Apple TV, and Amazon Fire.

*Continued on Page 26*

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# Minimum Risk Pesticides Exempted from FIFRA Registration

## WHAT IS A PESTICIDE?

Pesticide law defines a “pesticide” (with certain minor exceptions) as:

- ✓ Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest.
- ✓ Any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.
- ✓ Any nitrogen stabilizer.

EPA’s regulations provide additional clarification. Thus the intent of the product is important in determining if a specific product is a pesticide. The intent of the product can be determined by examining the:

- ✓ claims on the label and advertising;
- ✓ composition;
- ✓ use; and
- ✓ mode of action of the product as distributed or sold.

A product is likely to be a pesticide if the labeling or advertising:

- ✓ Makes a claim to prevent, kill, destroy, mitigate, remove, repel or any other similar action against any pest.
- ✓ Indirectly states or implies an action against a pest.
- ✓ Draws a comparison to a pesticide.
- ✓ Pictures a pest on the label.

Except in limited circumstances, any substance falling within this definition of a pesticide must be registered by the EPA before it can be legally sold or distributed in the United States. One such exception to the registration requirement is for those pesticides that the Administrator, under section 25(b) of FIFRA, has determined “to be of a character which is unnecessary to be subject to this Act,” and that have been exempted from the requirements of FIFRA by regulation.

## MINIMUM RISK PESTICIDE: Definition and Product Confirmation

### What is a minimum risk pesticide?

Because EPA has determined that certain “minimum risk pesticides” pose little to no risk to human health or the environment, EPA has exempted them from the requirement that they be registered under the Federal Insecticide, Fungicide, and Rodenticide Act. This exemption provision is located in 40 CFR 152.25(f).

Pesticides are used to control various pests, such as mosquitoes, ticks, rats and mice. Pesticides are also used in agriculture to control weeds, insect infestation, and diseases. There are many different types of pesticides; each is meant to be effective against specific pests.

Starting in 1996, we exempted such products to reduce the cost and regulatory burdens on businesses and the public for pesticides posing little or no risk, and to focus our resources on pesticides that pose greater risk to humans and the environment.

### Will EPA confirm that my product is a minimum risk pesticide?

Generally, EPA does not review products that claim to meet the criteria set by 40 CFR 152.25(f) for exemption from pesticide regulation for companies planning to market such a product. We also do not provide a label review of such products. The producer is responsible to carefully read the criteria and make an evaluation of how the product meets (or does not meet) the criteria.

If a product does not meet all of the exemption criteria, the product is not exempt from FIFRA regulation under 40 CFR 152.25(f), and sale or distribution of the product without registration may be a violation of FIFRA unless it is otherwise exempt from registration requirements. In these cases, the producer should contact EPA

## Active ingredients allowed in minimum risk pesticides

Castor oil  
Cedarwood oil  
Limited to Virginia, Texas and Chinese cedarwood oil  
Cinnamon and cinnamon oil  
Citric acid  
Citronella and citronella oil  
Cloves and clove oil  
Corn gluten meal  
Corn oil  
Cottonseed oil  
Dried blood  
Eugenol  
Garlic and garlic oil  
Geraniol  
Geranium oil  
Lauryl sulfate  
Lemongrass oil  
Linseed oil  
Malic acid  
Mint and mint oil  
Limited to corn mint and spearmint  
Peppermint and peppermint oil  
2-Phenethyl propionate  
Potassium sorbate  
Putrescent whole egg solids  
Rosemary and rosemary oil  
Sesame and sesame oil  
Sodium chloride  
Sodium lauryl sulfate  
Soybean oil  
Thyme and thyme oil  
White pepper  
Zinc

to seek a registration for the product. For the possible consequences of a violation of FIFRA, refer to the section on Enforcement Related to Minimum Risk Pesticides.

### FOR MORE INFORMATION

EPA can answer questions or provide additional information. Contact EPA about minimum risk pesticides by email at [pesticidequestions@epa.gov](mailto:pesticidequestions@epa.gov). **PP**

*Excerpted from EPA.gov, “Minimum Risk Pesticides Exempted from FIFRA Registration.”*

Learn more at  
<https://www.epa.gov/minimum-risk-pesticides>



An alligator in your swimming pool: Nuisance animal

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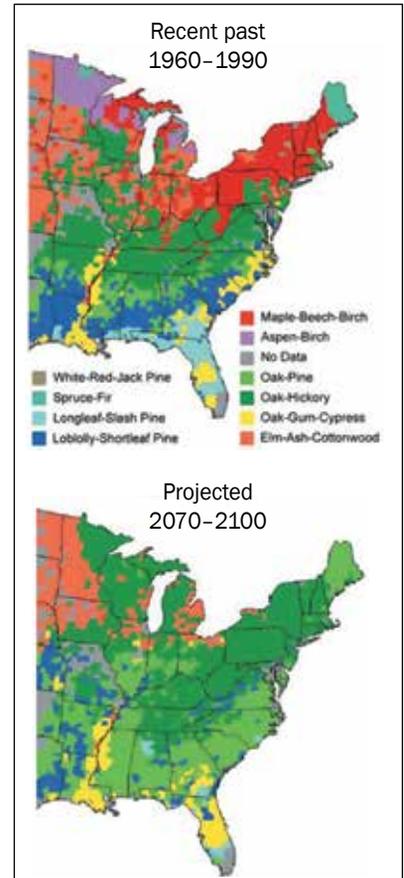
*Invasives, continued from Page 14*

For nuisance animals, Florida law defines these as native or nonnative animals that may be causing harm to property or humans. For instance, an alligator in a swimming pool would be considered a nuisance.

A couple of key points to remember when using the term “nuisance” is that all invasive species are automatically considered a nuisance. Also, just because one animal or population of plants is considered a nuisance, that does not mean that the entire species should also be categorized this way.

**Range Change**

A range change occurs when a species changes in size. Both nonnative and native species can experience range changes. It means that the area where the species is found either grew, shrunk or shifted. Just because a range change occurred and a species moved into a new area, does not mean that it then becomes invasive. There are many factors that influence a range change.



Range change: Forest types are projected to shift as the climate continues to warm. Credit: EPA

**S**TANDARDIZING this language is a helpful for both professionals and clientele. It allows for better communication, education, and outreach of the natural world. While it may take some time to get used to using new terms, it will be a great benefit. A few terms that the UF/IFAS Invasive Species Council recommends to NOT use when talking about species include native invasive, invasive weed, invasive exotic, and alien/foreign/nonindigenous.

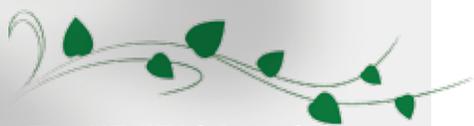
To learn more about the suggested terminology in detail or to provide these terms to your clientele please visit the IFAS publication FOR370, *Standardized Invasive Species Terminology for Effective Outreach Education*, at <https://doi.org/10.32473/edis-fr439-2021>. **PP**

*Erin Harlow is Horticulture Agent III at Columbia County Extension Office.*

#### Resources

Florida Fish and Wildlife Conservation Commission. 2022. <https://myfwc.com>

Iannone III, Basil V., Emily C. Bell, Shannon Carnevale, Jeff E. Hill, Julie McConnell, Martin Main, Stephen F. Enloe, Steven A. Johnson, James P. Cuda, Shirley M. Baker, and Michael Andreu. 2021. "Standardized Invasive Species Terminology for Effective Education of Floridians: FOR730/FR439, 8/2021." EDIS 2021 (4):8. <https://doi.org/10.32473/edis-fr439-2021>.



**The UF/IFAS Invasive Species Council** includes both faculty and Extension agents who are dedicated to working together to solve problems created by any invasive species. Their work includes plants, vertebrates, invertebrates and pathogens.

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Carrie Stevenson is the Coastal Sustainability Agent for the UF/IFAS Escambia County Extension Office, and has been with the organization since 2003. Her educational outreach programs focus on living sustainably within a vulnerable coastal ecosystem. Her expertise and articles focus on climate issues, stormwater, hurricanes, native plants, and wetlands.

Growing up an avid reader and science junkie, a young Carrie aspired to find a career that allowed her to “be outdoors and wear jeans,” and in college sought to become a science writer. Turns out, those skills were ideal for a career in Extension. A lifelong outdoors enthusiast, she enjoys biking, standup paddleboarding, and traveling to national parks with her family.

Carrie earned her master’s degree in biology/coastal zone studies from the University of West Florida in Pensacola and an undergraduate degree in marine science from Samford University (Birmingham, Alabama).

She is the proud mom of an Eagle Scout and leads her daughter’s Girl Scout troop. She is a Fellow in the Natural Resources Leadership Institute (NRLI), past president of the Florida Association of Natural Resource Extension Professionals (FANREP), and member of IMPACT 100 Pensacola Bay.

You can reach her at [ctstev@ufl.edu](mailto:ctstev@ufl.edu). More about Carrie: <http://nwdistrict.ifas.ufl.edu/nat/2020/08/27/meet-the-author-carrie-stevenson/>.

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Giant whip scorpion

Justin Overholt

# Ask IFAS: Giant Whip Scorpion Q&A



Have you come across a giant whip scorpion?

The name giant whip scorpion, *Mastigoproctus giganteus giganteus*, may draw fear in the public perception. The sight of this arachnid, also known as a vinegaroon or grampus, might further draw unrealistic public perceptions of its dangerous qualities.

UF/IFAS expert **William Kern** explains this species and what to do if you happen to run into one in Florida.

FORT LAUDERDALE, Fla. — With recent media exposure of an arachnid known as the giant whip scorpion, the public perception of this species tends to draw some concerns over its potential for harm to humans, pets and the environment.

In a co-authored article found on Ask IFAS, William Kern, an associate professor in the Entomology and Nematology Department at the UF/IFAS Fort Lauderdale Research and Education Center, gives us a closer look at the arachnid known to spray acid if molested.

For added measure, here are seven extra bites of information from Kern.

- Q:** Are giant whip scorpions dangerous to humans and pets?
- A:** No. They are neither venomous nor physically hazardous. They can give a mild pinch with their pincers

(pedipalps). Most mammals and birds will not eat them because they are distasteful, but not poisonous.

- Q:** Are giant whip scorpions considered invasive to the environment?
- A:** The Florida giant whip scorpion is native to Florida. In 2018, the Florida population was elevated to a species rather than a subspecies.

- Q:** Where are they most likely to be found in Florida?
- A:** The Florida whip scorpion lives in deep, well-drained sandy soils like long-leaf pine sandhills, sand pine scrub, coastal and relict dunes. They may have burrows, but often just burrow under logs and boards on the ground. Their population has been declining due to habitat loss and over-collecting for the pet trade. *Continued*





Giant whip scorpion

Acrocynus

*Whip Scorpion, continued*

**Q:** Your article states that the species will bite under certain conditions. What are these conditions? Is the bite painful and venomous?

**A:** I have never been bitten by a whip scorpion. They will try to defend themselves by pinching you with their pedipalps. It is a mild pinch, like being bitten by a small anole (lizard). They are considered harmless to people and pets.

**Q:** One of the facts reported in the article is that it can spray acetic acid. What condition causes this giant whip scorpion to do so and what do I do if I, my family or pets are sprayed?

**A:** This is a defensive behavior, and they spray a fine mist of acetic acid somewhat stronger than food-grade vinegar at predators that get too close.

The spray can sting the eyes and irritate the nose and doesn't taste good. It comes from two pores at the base of the "whip." They are actually pretty accurate with the spray. On skin it usually does no harm, but just wash the exposed skin with soap and water before you touch your eyes. If it gets in your eyes, flush them with clean water.

**Q:** If I find one on my property, is there a likelihood that there are others? If so, how do I get rid of them?

**A:** It is possible that if you find one, then your property is the right habitat for them, so there may be more. Why get rid of them? They are harmless, eat cockroaches and millipedes, and they are cool.

**Q:** Do people have these species as pets?

**A:** Unfortunately, they are sought as pets, but they rarely do well in captivity. Collection for the pet trade has had a negative impact on most populations, especially in Florida. Appreciate them in the field, then leave them in peace. They are very photogenic, so you don't need to collect them. **PP**

*By Lourdes Mederos, UF/IFAS*

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## PCO Pointer

# Facts from FDACS: The End of an Era



ON JUNE 30, Mr. Joseph Parker retired from The Department of Agriculture and Consumer Services. Joe has been such a big help to the pest control industry in his 30 years of service. Starting with the Bureau of Entomology and Pest Control as an inspector, he advanced to Bureau Chief. But his real expertise is in the area of IT.

Joe has overseen the state certification exams for the last couple of decades and has advanced the exams to the quality that they are today. He has been also working tirelessly on the Fumigation website, which is a lot better than it has

been in the past. Joe has also been a driving force behind the Pest Control Advisory Council meetings. How he kept all those notes is beyond me! Joe has been a big help to many of us that have struggled with the CEU system.

Joe's most important asset to the pest control industry and the Department was his knowledge of the past rulemaking. He was there when most of the rules the industry must abide by were written. Joe has such a wealth of knowledge when it comes to understanding the rules and to make them easy to understand and apply.

Joe understands the importance of keeping Chapter 482 — the Structural Pest Control Statute — and Chapter 487 — the Agriculture Pest Control Statute — separate from each other, which is very important to the pest control industry.

It has been my pleasure to work with Joe over the past twenty years, he will truly be missed! It will take more than one person to fill his shoes.

THANK YOU, JOE! **PP**

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

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*Ben Hottel, continued from Page 18*



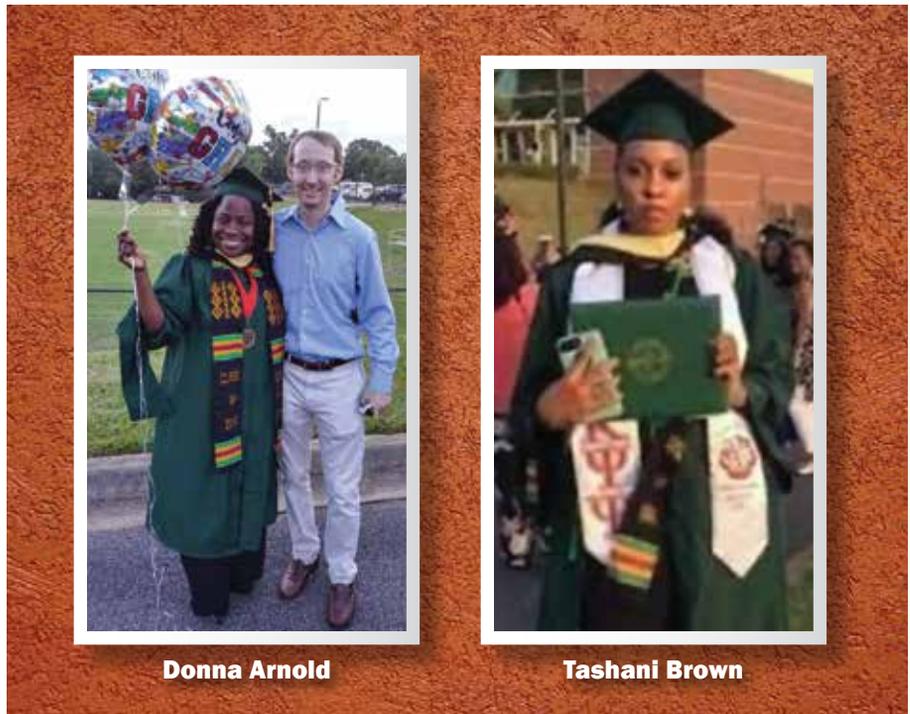
**Phil Koehler and Ben Hottel**

**Some Industry, Some Academia — All Urban Entomology**

After graduating from the University of Florida in 2015, I worked for a year with American Pest Control out of Fulton, Maryland. There I was a quality control supervisor at their National Institute of Health account in Bethesda, Maryland. I learned a lot about integrated pest management from the urban pest management side of things.

My next position took me back to Florida, where I was hired at Florida A&M University as an assistant professor in urban entomology. I worked with Jan Peters in hosting the Annual Florida A&M University Field Day Conference each year.

One of my favorite things about my job was working with students. I taught a wide range of courses, ranging from medical and veterinary entomology to forensic entomology. I also created and taught the first online general education biology course in entomology at Florida A&M University.



**Donna Arnold**

**Tashani Brown**

I graduated two master's students: Donna Arnold, class of 2019, worked on red imported fire ants, and Tashani Brown, class of 2020, worked on subterranean termites. Donna is working as a UF/IFAS Extension agent for Gadsden County, Florida, and Tashani is on the technical team for Terminix.

**M**Y CURRENT position is technical services manager for Rollins out of Atlanta. Rollins is the parent company for a number of pest control companies

both internationally and domestically. Some of the brands found in the Southeast are Orkin, HomeTeam, Northwest Exterminating, McCall Service, IFC, TrueTech, Critter Control, and Missquito.

I started the position at the beginning of 2020. Things were certainly a bit different that year, given all the COVID stuff going on, but I could tell that both Rollins and Atlanta were a good fit for me. It has been a great experience being able to take some of the skills in academia and carry them over to my position with Rollins. **PP**

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