AUGUST/SEPTEMBER 2022

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Managing Obscure Turfgrass Pests

Cockroaches In Your Mind

OFFICIAL MAGAZINE OF FLORIDA PEST MANAGEMENT ASSOCIATION

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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

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

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Cockroaches: They not only live all around us, they often live rent-free in our heads. What other insect appears so often in movies, TV shows, and video games, *and* has its own song? None other than the *cockroach!*

Photo by Barnaby Chambers

FPMA: Proud to Set the Standard

Message from the President of FPMA, Suzanne Graham

LAST MONTH I was invited by NPMA to speak about our Economic Impact Study before state association leaders during NPMA's Legislative Days. I always believed that FPMA was the best state association, and now, based on the accolades I received from both NPMA and other state association leaders, it was clear to all that FPMA is setting the standard.

Was I proud? Yes! Can we afford to be complacent about how we conduct our association going forward? *No way!*

During my time as President, we have gone through many changes to improve how we serve our membership. Some of the changes came in the form of changes to the Association's By-laws. Other changes were about how we delivered our services — from online live CEUs, to EXPO's new TECH DAY, to reformatting the Summer Conference's pricing structure and agenda.

Meeting Up, Earning CEUs

This year's Summer Conference will take place at the Hammock Beach Resort and Spa in Palm Coast, Florida, June 13–15. FPMA held the Summer Conference here in 2016. Since then, the property has undergone extensive renovations, and the event planning committee will be sure to make the most of the new accommodations. Our members asked for a simplified pricing structure and agenda. You asked. We listened.

Like last year, this year's event will be a Pay-One-Price (POP) for both vendors and attendees. Classes and workshops will take place in the mornings with plenty of time to socialize, play golf, or just relax poolside in the afternoons. So, bring your bathing suit and some bling for this year's *Beach Blanket Blingo* theme! See **www.flpma.org** under Events for more details and to register.

Regional meetings are ramping up again, and we are currently "experimenting" with all-day CEUs at the regional level in some locations. So far, the Southeast, Southwest and Northeast regions have taken the plunge. As of this writing we don't know how this change will be received, but we are trying it in hopes of making it easier and more engaging for members to get their CEUs as well as providing opportunities to recruit new members.

And for those of you in other regions who are holding single CEU meetings, or for those of you who just can't make it to any meetings, we will be holding "Last Chance" CEUs in late May, so watch the website and emails! See **www.flpma.org** under Regional Meetings for a list of meetings, meeting details, and registration.

Getting Better All the Time

All of the changes that have been made in the last few years came about because the Board, along with our committees, never got complacent about what we do. As a group, we are relentless in our efforts to improve our Association. As always, we are here, and we are listening. PP

Suzanne Graham
President, FPMA

JOIN FPMA! Visit **flpma.org** for more information.

A New Era In Pest Management Education

COVID-19 changed the world. It changed the way everyone works and obtains education and current information. Even newspapers that delivered local news to households have been affected. I was just notified by our local newspaper, which I have had delivered to our doorway every morning for the past 47 years, that they will not deliver on Saturdays any longer.

The pest management industry has also been affected in many ways. It is more difficult to obtain workers. It is more difficult to buy service vehicles. In fact, every aspect of our lives has changed.

Most importantly, the way we obtain accurate information and have meetings with others has changed and involves less travel and less personal contact. For the past two or so years, pest management education has principally been conducted in Zoom meetings where the speaker talks to a computer. That educational program is then broadcast to the attendees wherever they are located. This is probably not the best way to learn, but is a substitute for on-site meetings.

Things are now rapidly changing again. People are traveling, and pest management meetings are being held face to face. I have been at several, and I have seen how happy people are to see their friends and business workers face to face. Attendance at these meetings is back to pre-COVID numbers.

Pleased to Meet You AGAIN!

Speaking of meetings: This past March, we held the Northwest Florida Pest Management conference in Niceville and had more than 100 people attend. You could see from the happy faces that everyone was happy to finally be able to attend an event in person.

By the time you read this another conference, the Southeast Pest Management Conference, will have been held on May 3–5 in Gainesville. After two years of holding the event virtually, everyone had been looking forward to hearing presentations from a lot of our former UF students and enjoying the superb food, especially the Sapp Walkup Steak Dinner on May 3. How wonderful to see everyone again at the Physics Building on the University of Florida campus!

The Southeast Pest Management Conference is designed to feature GHP pests on the first day, wood-destroying organisms on the second day, and lawn and ornamental pests on the third day. If you are ever looking for a great networking opportunity, please keep in mind the Southeast Pest Management Conference every spring.[1]

Another great meeting that will be held soon is the FPMA in Paradise Summer Conference on June 13–15. The conference will be at the wonderful Hammock Beach Resort in Palm Coast, pictured above. The meeting will give plenty of time for families to enjoy each other, plus great technical and business presentations. Information on registering for the event is on the FPMA website at **flpma.org**.

In the fall, we will hold the Southwest Florida Pest Management Conference. We have not started planning it yet, but we expect it will be held toward the end of September at the Southwest Florida State College in Ft. Myers. That meeting is always well attended by both certified operators and technicians. Keep your eyes open for word on that conference.

Besides the face-to-face conferences that are coming up, FPMA is holding regional and online CEU classes for the industry. Be sure to attend these to keep your training up to date.

Pest Management Education Delivered to Your Mailbox

PestPro magazine continues to give the most academically relevant information to pest control company owners, certified operators, and technicians. You cannot beat the price. We send the magazine for free to more than 12,000 PMPs throughout Florida. We plan to continue making it available to the industry for many years to come. It is a great way for researchers at the University to provide the latest findings and science-based information to you. You too can publish in *PestPro:* If you have an interesting pest control case you think the industry would be interested in hearing about, let us know.

Sharing Our Knowledge With You

Pest management is a unique service industry that has a close relationship with scientists who help you implement the most current research findings and information to optimally manage pests. Other industries do not have this close relationship. The only way to maintain quality service is to attend these meetings and read the trade information.

Remember, pest species are changing due to new introductions from other parts of the world. The insects that we currently have are changing: They can develop resistance to insecticides used to control them. The insecticides are changing, with new active ingredients and formulations available. The best ways to understand how to deliver the best service to your customers is to attend face-to-face meetings and interact with other people in the same business, go to online meetings to obtain information, or read magazines and journals, like *PestPro* magazine.

Your education and commitment to a quality pest management service affects the entire industry. Our goal is to assist the pest management industry in maintaining excellence in the eyes of your customers. PP

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

[1] https://entnemdept.ufl.edu/sepmc/Main_Page.html

Cockroaches

Roberto Pereira

COCKROACHES:

The household pest insects we know so well are part of cultural backgrounds worldwide. Cockroaches have been closely associated with humans and their housing probably from the time people started occupying any location for more than a few days.

For a land that was not originally occupied by cockroaches, the United States has made itself a generous and inviting place for these insects. *America, the Land of Opportunity,* certainly lives up to its brand for these lowly insect visitors that found a home here.

American cockroaches thrive in the States now, but their ancestors once lived far, far away.

Soldier termite and death's head cockroach

ODD COUPLE?
Order Blattodea now includes all cockroaches *and termites!*

In Your Mind

ONCE UPON A TIME, domestic cockroaches were absent in certain geographic locations where we now accept them as a part of life. One of these locations was right here in what would become the United States. Yes, even the American cockroach was not "American" in origin. This common insect was not here until Europeans brought it over, likely in ships that sailed from Africa during the slave trade.

True "American" cockroaches exist, but they are not generally associated with human habitations and are not likely to be pests. One cockroach that is native to the Americas is commonly known as the Cuban cockroach: a green cockroach found in large numbers in agricultural fields in South Florida. This insect is native to North America but not to the United States, having been brought here from the Caribbean islands.

The first foreign cockroach to arrive on our shores was the German cockroach, which caught a ride on Spanish ships that came here way back in the early 1500s. They probably liked the place — after hundreds of years of Americans telling them they are not welcome in our houses and buildings, hordes of German cockroaches are still hanging around here as if this was their land.

Despite their being commonly found in so many places and a constant companion to human trajectory in the world, cockroaches generally are not appreciated as companions by humans. We have made a point of getting rid of cockroaches for as long as they have been around. In fact, we tend to think of the cockroach as the lowest form of life, one that cannot offer us any insight into the nicer, more advanced aspects of life.

One can think of cockroaches as good survivors, experienced operators that have been able to outlive any of the weapons we throw at them. From insecticides one after the other, to high doses of radiation in experimental facilities, cockroaches have been able to outlive our most sophisticated weapons used in the attempt to control their populations. The American cockroach is a symbol of strength packed in a fragile body that will crack under the pressure of a heavy foot.

The Big Picture

Although there is variability among the cockroaches, their entire order consists of insect species that are fairly similar. Or so we thought until 2018, when cockroaches and termites were officially lumped together in the order Blattodea. Yes, that nice separation that entomologists got comfortable with is now gone, and cockroaches and termites must get used to living in the same taxonomic order — even as they live in different categories in our pesticide applicator exams and licenses.

Honestly, I do not think the cockroaches are any happier with this new taxonomic arrangement than I am. Cockroaches and termites may share some distant, mostly extinct relatives, but the problems they cause in human buildings are very distinct. It is true, though, that cockroaches when hungry or desperately trying to escape will chew through anything, including wood, which can provide some nutrition to the hungry, desperate roach. Although many species can survive a long period without eating, nibbling on unusual materials may get cockroaches through when food is scarce.

A GOOD LINK in the chain of life, cockroaches serve as tasty treats for animals from birds to mammals. It does take getting used to any chemicals present on the cuticle and other parts of the cockroach body. These chemicals are there to benefit the cockroach, and may include signaling chemicals and even antimicrobial elements. For some predators, the ability to peel off cockroach legs and wings makes the treat a little easier to swallow and digest.

Continued on the next page

SOME COCKROACH PREDATORS

- Toads and frogs
- Lizards
- Turtles
- Hedgehogs
- Opposums
- Beetles
- Rodents
- Cats
- Dogs
- Birds
- Spiders
- Centipedes

COCKROACHES in POPULAR CULTURE

Movies that feature cockroaches

- *An American Tail*
- *Bug*
- *Creepshow*
- *Damnation Alley*
- *Enchanted*
- *Gagamboy*
- *Godzilla vs. Gigan*
- *Joe's Apartment*
- *Men in Black*
- *Mimic*
- *The Nest*
- *Oggy and the Cockroaches: The Movie*
- *Pacific Heights*
- *Twilight of the Cockroaches*
- *WALL-E*

TV shows with single cockroach episodes or recurring themes

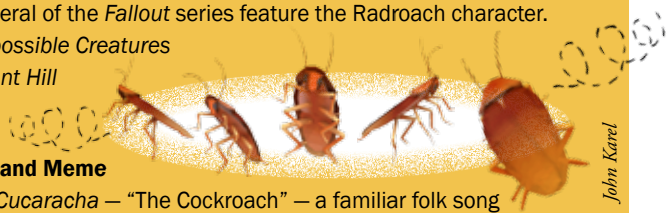
- *ALF*
- *All That,* Season 6, Episode 4
- *Freaky Stories,* hosted by a cockroach named Larry
- *Heroes*
- *King of the Hill*
- *Oggy and the Cockroaches,* with Dee Dee, Joey and Marky
- *The Powerpuff Girls* episodes "Insect Inside," "Bubble Boy"
- *Teenage Mutant Ninja Turtles*
- *Transformers Animated*
- *X-Files* episode "War of the Coprophages"
- *Yin Yang Yo!*

Literature

- *Archy* was a typewriting cockroach in a series of newspaper columns by Don Marquis.
- Comic series *Badger*
- *Cockroaches,* the second in the Harry Hole crime novel series by Norwegian writer Jo Nesbø
- The independent 1980s comic book series *Domino Chance*
- Vertigo Comics' *The Exterminators*
- *Gregor the Overlander* by Suzanne Collins
- Marc Estrin's *Insect Dreams: The Half Life of Gregor Samsa*
- Tyler Knox's noir comedy *Kockroach*
- Franz Kafka's story *The Metamorphosis*
- *Naked Lunch,* William S. Burroughs novel, made into a movie
- Clarice Lispector's 1968 novel *The Passion According to G.H.*
- *Revolt of the Cockroach People,* by Oscar Zeta Acosta
- Daniel Evan Weiss's novel *The Roaches Have No King*
- Steve Purcell's comic book series *Sam & Max*
- Manga series *Terra Formars*

Video games with cockroach characters and/or themes

- *Animal Crossing* series
- *Bad Mojo: The Roach Game*
- Several of the *Fallout* series feature the Radroach character.
- *Impossible Creatures*
- *Silent Hill*



John Karel

Music and Meme

- *La Cucaracha* — "The Cockroach" — a familiar folk song
- *Dancing Cockroach,* https://knowyourmeme.com/memes/dancing-cockroach

Cockroach Lore And Culture

Roaches are so closely associated with human lives that people have bestowed upon them some interesting "powers." Some believe that seeing a "white cockroach" is a sign that someone is gossiping about you. Actually, a white cockroach is just a recently molted cockroach that has not yet had time to harden its cuticle. The cuticle will end up becoming its natural color, generally brown. I guess people gossip a lot about the poor souls that have the job of caring for cockroach colonies. Cockroach breeders see white cockroaches all the time — there is always a roach molting!

Cockroaches were used, and in some places are *still* used, as a home remedy. In some parts of the world, a boiled or fried cockroach may be used to treat indigestion or earache. In ancient Rome, a crushed cockroach mixed with fat would be used to prevent itching. Some folks recommend cockroach as a remedy for upset stomach.

Fortunately, there are other effective, proven remedies for health ailments. A cockroach should probably not be used as medicine, given its allergens and other properties that may cause problems to the sick person. But that is not to say that chemicals found in cockroaches and other insects cannot or will not be used as the base for medical products. There is a lot be learned about these potential uses. Because one can grow a lot of cockroaches on discarded food, they can be a cheap source of potentially useful materials.

Cockroaches are generally considered a very low form of life. It is common for certain groups to refer to their enemies as cockroaches, possibly because of the normal association of cockroaches with garbage and other unsanitary conditions.

Ready for their closeup: Madagascar hissing cockroaches

Liz West

There are exceptions to this general rule — some positive associations with cockroaches may occasionally appear in movies and stories. One positive association is the idea that cockroaches are able to survive anything — they are indestructible.

The use of cockroaches in movies is something that disturbs entomologists everywhere. The Madagascar hissing cockroach is often used to unfairly portray cockroaches as a threat to humanity in movies. This species is large, docile and relatively slow compared to faster, more agile cockroaches. This roach is not associated with filthy places and diseases and is not a real threat to humans — at least nothing like the sewage-inhabiting species that could indeed carry pathogens on their body. The use of Madagascar hissing cockroaches in movie roles has nothing to do with their real nature and potential threat, but is a consequence of their relatively easy rearing procedure and large, photogenic body.

In Your Mind

Judging by the numerous examples of cockroaches depicted in movies, TV shows, and other art forms, our obsession with cockroaches goes really deep. Humanity may need the help of a good mind doctor to help explain all of *that.*

A few entomologists and pest control operators might offer advice on the biology and control of these creatures. Are you up to the task? PP

Roberto Pereira is Extension Professor in Urban Entomology at the UF/IFAS Entomology and Nematology Department.

Out of Sight, Out of Mind—Until It's Too Late!

Managing Obscure Turfgrass Pests

Adam G. Dale, PhD

Hunting billbug adult on St. Augustinegrass

White grub larvae on soil surface

Insect photos: Lyle Buss

MOST lawn and ornamental professionals manage what they can see, and most clientele complain about what they can see. When it comes to insects, you may see yellowing turfgrass and dozens of little chinch bugs crawling around amidst the damaged plant tissue. Or a camellia shrub may have a bunch of yellow leaves that when flipped over, are covered in brown and white waxy tea scale insects. In both cases it's pretty simple to connect cause and effect.

However, when there isn't an obvious culprit associated with plant damage, things get a little more challenging. This is often the case when it comes to subterranean insects, or those that live and feed predominantly underground.

There are several key insect pests of turfgrasses that spend at least a portion of their lives feeding on plant tissue beneath the soil surface. These include mole crickets, white grubs, billbugs, and ground pearls. In many cases, the plant damage associated with these insects does not appear until well after the insects have infested the area and been feeding on the plants undetected. Moreover, signs of plant damage often mean that the optimal treatment window has passed for reducing populations of the pest responsible for the damage. For these reasons, belowground pests can be some of the most challenging pests to manage in turfgrass systems.

Obscure Turfgrass Beetle Pests

Hunting billbugs and several white grub species can be damaging and difficult-to-detect turfgrass pests. White grubs are the larval stage of scarab beetles and come in multiple sizes depending on the species and maturity of the larva. Grubs damage turf by consuming roots within the soil, disabling the turf from being able to uptake water and nutrients. What you or the client sees appears to be drought stress, until you look beneath the surface and find no roots and/or C-shaped white grubs lying in the soil. *Continued on Page 11*

June 13th-15th | Hammock Beach Golf Resort & Spa | 200 Ocean Crest Drive | Palm Coast

Registration Open!

- In-Person Event
- Time to Relax and Network
- Meet Vendors Face-to-Face

Details and Registration at www.flpma.org

(under "Events")

Ground pearl adult near center and nymph near bottom of quarter used to indicate size

Insect photo: Larry Williams

At this point the damage is done, and curative approaches to pest management may be necessary. For this reason, the conventional approach to white grub management is preventive insecticide applications to turf areas with a history of white grub infestations. Fortunately, there are several newer insecticides such as chlorantraniliprole, tetraniliprole, and novaluron that can provide effective preventive control while posing substantially less risk than traditional insecticides to beneficial organisms also living in turfgrass areas.

HUNTING BILLBUGS are weevils (beetles with "snouts") with a unique life history compared to many other turfgrass-feeders. They spend each life stage in a different part of the turfgrass profile. The eggs and young larvae occur in turfgrass stems, older larvae and pupae occur around the soil surface, and adults live and feed in the turf canopy.

Hunting billbugs have recently been a leading topic of conversation in the southeastern turfgrass industry. Beginning in late summer and continuing through the fall, sod growers, golf course superintendents, and pest control professionals alike notice patchy dieback that resembles drought stress, but without drought. Similar to white grubs, once drought stress signs begin to show up, the damage has been done for that season.

Effective hunting billbug management requires targeting spring populations that are emerging from the cooler winter months and the young larvae that begin to develop in the spring. Billbugs tend to spend the winter as adults in weedy areas or along forest edges where there is more complex and diverse vegetation to seek refuge. Once the weather warms and days lengthen, billbug adults migrate into turfgrass stands where they can begin to reproduce and actively feed.

Hunting billbug side view

▲ *Closeup of ground pearl nymphs next to a ruler. Hairlike mouthpart can be seen emerging from the right of the far-right pearl.*

Photo at top: Lyle Buss
Photo at left: Iustin Cret

Hunting billbugs will feed on any warm-season turfgrass but are most damaging to zoysiagrass, except for 'Diamond' zoysia, which is reportedly resistant.

A critical tool for detecting adult billbug spring activity are pitfall traps. In February – April, depending on region, place a Solo cup or something similar into the soil so that the lip of the cup is level with the soil surface. As billbug adults walk across the soil they will fall into the cup and become trapped. Their frequent presence in the cups is a key indicator that spring activity has arrived and it is the most effective time to target them with insecticides. If yellow or brown turf foliage is noticed, do a "tug test" on that tissue by lightly tugging on it from the top. If it breaks in half and the stem is filled with a sawdustlike material, billbug larvae were likely feeding in it.

Hidden turfgrass sap-feeders

One of the most obscure and difficult-to-manage subterranean insect pests of turfgrasses in the South are ground pearls. These sap-feeding insects are scale insects, like the ones you see on ornamental plants, that live in the soil and feed on turfgrass roots. Ground pearl nymphs look like pearls — hence their name — with a hairlike mouthpart tapped into root tissue. The only way to find ground pearls is by digging them out of the soil, which is certainly not ideal for preserving an intact turfgrass lawn.

Ground pearl damage most frequently occurs in centipedegrass lawns and will appear as rings of yellowing foliage. Unfortunately, there is no way to know you have a ground pearl infestation until the damage shows up.

These insects are very patchily distributed, so blanket insecticide applications to entire lawns is inefficient and likely ineffective. Therefore, spot-treating damaged areas with systemic insecticides and/or contact-toxic products that are aggressively watered in is the primary approach to control.

Photo at right: Mole cricket species that occur in the Southeast.

Photos by USGS (top) and Lyle Buss (right)

Invasive mole crickets

The final group of subterranean turfgrass insect pests are invasive mole crickets. There are three invasive mole cricket species in the southeastern United States: the southern, tawny, and shortwinged mole cricket.

As their name implies, mole crickets tunnel through the soil like moles, uprooting plants and feeding on root tissue. This can be problematic for high-maintenance turfgrass areas that need uniform playing surfaces, like golf courses and athletic fields. It can also thin out turfgrass stands, facilitating weed invasion and an overall decline in turfgrass performance.

Mole crickets prefer low-lying, wet soils and are highly attracted to lights kept on at night. Therefore, turning off night lights and targeting low-lying turfgrass areas with monitoring and management efforts is recommended.

Monitoring is a critical component of mole cricket management. The most effective survey method is a soapy water flush, where you pour a dish detergent solution onto a turfgrass area with suspected mole cricket damage. Any mole crickets inhabiting that soil will come to the surface for fresh air, telling you their presence/absence, density, and life stage.

The optimal time for mole cricket intervention with insecticides is also in the spring, when young nymphs about one-half inch long make up most of the population. For any insect enthusiast, mole crickets are hands-down the most fascinating turfgrass pests out there.

The bottom line on belowground bugs

When it comes to managing turfgrass insect pests, those that live and feed out of sight can be the most challenging pests to manage. Out of sight frequently means out of mind, which often results in plant damage and more expensive intervention. Therefore, I highly recommend becoming familiar with the belowground pests that may occur in your area and in the turfgrass types that you're managing.

Once you know what could show up, you can actively monitor for them and stay ahead of the damage. **PP**

Adam Dale, Turf and Ornamental Entomologist, is Assistant Professor at UF/IFAS Entomology and Nematology Department.

Dr. Adam Dale can be reached via email at agdale@ufl.edu. More information about his research and extension programs at the University of Florida can be found at https://dalelab.org.

Red imported fire ants invade a picnic

Argentine ants

C.C. Burke

For pest pros, Argentine ants are among the most challenging pests and may be even found in electrical circuits and switches.

Ant Control Tips

Cory Goeltzenleuchter

ONE OF the most recognizable pests, to consumers, is the leading cause of many pest control operators' headaches. We all have had these pesky invaders wreak havoc on our picnics.

These pests have been the focus of many blockbuster films, from the 2015 Marvel movie *Ant-Man* to one my favorite Pixar movies, *A Bug's Life,* from 1998. There is even an attraction at Disney's Animal Kingdom starring the ant from *A Bug's Life,* Flik, that is called "It's Tough to be a Bug!"

For many years, ants have been one of the most challenging pests for pest control companies to handle. Along with the millions of dollars spent by consumers on ant control every year come the thousands of call-backs the pest control industry responds to.

To improve your success rate in handling these pests, I have developed these three easy focus topics for your company's next ant control training class:

1. Properly handling the inbound customer call.
2. Identification and treatment strategies.
3. The follow-up.

Properly handling the inbound customer call

When a customer of yours calls in for service, they may or may not have done their research on their problem beforehand. Whether they have scrolled your pest library on your company's website or searched feverishly through Google, they know a bit about their ant issue.

For customer care centers, it can help them address the customer's need better if they have basic scripts of questions to ask customers. This can help narrow down the pest in question. While your call center employees don't need to know the intricacies of performing the service, they should know your basic treatment plan and how to get a customer to help out your service professionals.

This can include a basic knowledge of the difference between ants and termites morphologically. If they can create a great blueprint for our responding service professionals, it can lead to better results and a higher level of customer service.

Here is a list of some great ant control questions.

- When are you seeing the ants?
- Where are you seeing the ants?
- Do you see the ants anywhere else inside or outside of the home?
- Are the ants trailing, or are they very sporadic?

Continued on next page

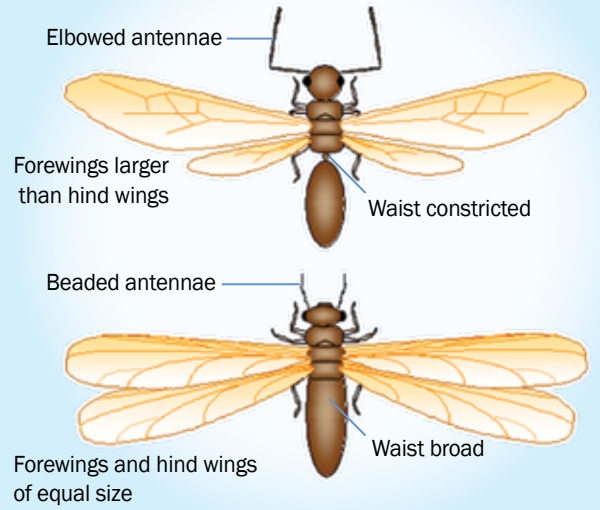
- About how large are the ants?
- How many ants are you seeing? Several individuals or several hundred?

One item that I always stress is customer education and teaching them the why behind what we do. Your customer call center must instruct the homeowner not to use any over-the-counter bug bomb or aerosol can. If they have, we need to know about it. Imagine going to a home to fight an ant infestation, just to show up and not find anything. Instruct your customer that we will need to follow those trails back to the main source of the issue. Killing these foragers with a can of RAID will eliminate that possibility for us and makes the control that much more complicated.

Now that your service professional has all the information they need, it's time to arrive and perform your service.

Identification and treatment strategies

When dealing with most pest situations, it is always best to know your opponent. You can lose and thoroughly confuse your technicians by going into detail on morphological differences between pest ants and covering every single ant. Choose to focus on 10 of your most common ant species that they will run into. For us in Florida, that might include carpenter ants, crazy ants, red imported fire ants, and Argentine ants. The Argentine ant was the 2018 *PCT Magazine*'s National Pest Champion in their bracket challenge of the most difficult pests.



Winged ant at top, and winged termite

When training on proper identification, focus on the three main differences between an ant and a termite swarmer. Ants have a pinched waist, called a petiole. Their forewings and hind wings are different sizes, and they have elbowed, or geniculate, antennae. With each of the 10 most important pest ant species you have "identified," be sure to focus on one or two key aspects that your technician can zone in on while making an identification. Also, ensure they have a small hand lens or a small phone-mounted microscope so they can make the proper identification.

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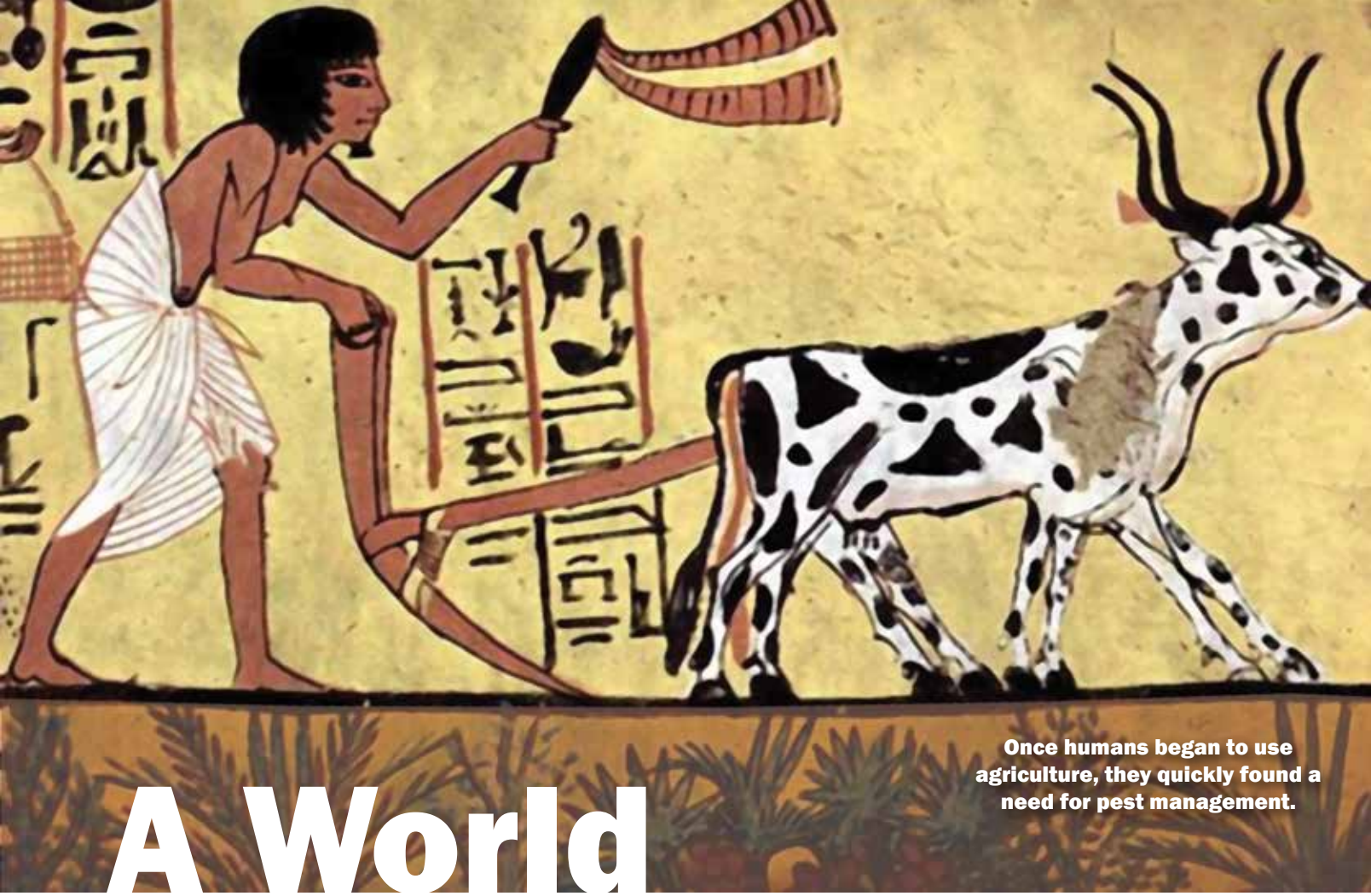

Once humans began to use agriculture, they quickly found a need for pest management.

A World *Without Pesticides*

Emily Kraus

Different mechanisms that drive insecticide resistance. These can result from genetic mutations that are passed down to the next generation *(Dara 2017)*.

DOES it sound great to have a world without pesticides? Your answer to this question likely depends on what you know about pesticides. Generally, a pesticide is a substance that deters or kills an organism that is harming human health, agriculture, the environment, or the economy. This could be a synthetic chemical purchased at the store or a simple mixture of soap and oil, DIY style — which may still be a pesticide.

While it may sound nice to have "A World Without Pesticides," this could actually result in increases in mosquito-vectored disease, reduced crop protection, and harm to the environment from invasive species. This is because pesticides are an integral part of the way we manage pests, given the tools we have at our disposal.

However, we are at risk of losing some of our pesticide tools. Why might we lose these options? The answer is *pesticide resistance*.

Pesticide Resistance

Considering pesticides have been used since 2500 BC, we are unlikely to lose these options completely. No one is taking away your diatomaceous earth. What I am really calling attention to is, what happens if we lose the option to effectively use synthetic pesticides for large-scale pest control? This is a reality, as we are seeing more and more cases of pesticide resistance.

Pesticide resistance occurs when a population of a pest becomes less susceptible to a pesticide to the extent that the pesticide can no longer provide control. In other words, the chemical doesn't kill enough of the pest anymore, and it continues to cause problems.

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Rodent Control

After a Disaster

Centers for Disease Control and Prevention

June 1 marks the official first day of hurricane season. As you prepare, don't forget the pests: After a disaster, rats, mice and other pests might enter homes and buildings.

Rodents and other pests can cause a problem for our health. They can spread diseases and bite people and pets. They can also trigger athsma attacks or allergic reactions in some people.

Norwegian rat, *Rattus norvegicus*

Zeynel Cebeci

Roof rat, *Rattus rattus*

Dumpharlain

House mouse, *Mus musculus*

RODENTS that survive a disaster often relocate to new areas in search of food, water and shelter.

Rats and mice are destructive pests that can spread disease, contaminate food, and destroy property. After a disaster, the number of rats and mice is often reduced, so illness or injuries associated with rats and other small rodents are uncommon in the short term.

It will take time for rodents to regroup, reorganize their social behavior, become familiar with their new environment, find safe haven, locate food and water, and memorize their movements. Colony building and reproduction will begin only when their new ecosystem has stabilized. This typically takes six to 10 months under favorable conditions.

As the rodent population grows and resettles, people have a greater chance of being exposed to the diseases carried by rodents. Rodent urine and dander also contain allergens that can cause allergic reactions or trigger asthma symptoms in sensitive persons, and more than 9,000 persons are treated in emergency departments annually for rat or mouse bites.

Indications that rodents are present—aside from seeing either live or dead ones—are rodent droppings, runways, rub marks, and tracks. Other signs include burrows, nests, gnawings, food scraps, rat hair, urine spots, rodent noises, insects that are associated with rodents, odors from urine, or dead rodents. Rats and mice are different animals, and methods used to control them will differ.

The following recommendations will help residents reduce the risk of disease or personal injury associated with rodents.

Precautions to Limit Household Exposure

Removing food sources, water, and items that provide shelter for rodents is the best way to prevent contact with rodents. Where necessary, control rodents by using an integrated pest management approach that includes environmental sanitation, proper food storage, rodent-proofing, trapping, and poisoning.

Inside the Home

- Keep food and water covered and stored in rodent-proof containers. A rodent-proof container is made of thick plastic, glass or metal and has a tight-fitting lid.
- Keep pet food covered and stored in rodent-proof containers. Allow pets only enough food for each meal, then store or throw out any remaining food. Do not leave excess pet food or water out overnight.
- Dispose of garbage on a frequent and regular basis. If storing trash and food waste inside the home, do so in rodent-proof containers.
- Wash dishes, pans and cooking utensils immediately after use.
- Remove leftover food and clean up any spilled food from cooking and eating areas.
- Do not store empty cans or other opened containers with food residues inside the home.
- When possible, use spring-loaded traps in the home and outside buildings. Use a small amount of chunky peanut butter or other available food as bait. (Remember, you are more likely to be successful trapping rodents if the home is free of other easily accessible food items.) Place traps in a "T" shape against baseboards or wall surfaces where rodent rub marks, droppings, or rodents have been seen. Keep children and pets away from areas where traps are placed.
- Glue traps and live traps are not recommended. Glue traps mainly catch juvenile rodents, not breeding adults. Rodents caught in live traps and released will likely reenter the home.

Continued on next page

Outside the Home

- Dispose of debris and trash as soon as possible. Store woodpiles and stacks of lumber or other materials at least 12 inches above the ground and as far away from the home as possible.
- Store garbage in rodent-proof containers with tight fitting lids.
- Store grains and animal feed in rodent-proof containers.
- Remove any food sources, including animal carcasses, that might attract rodents.
- Haul away trash, abandoned vehicles, discarded tires, and other items that might serve as rodent nesting sites.
- Keep grass short and cut or remove brush and dense shrubbery that may provide rodents cover and protection.
- Trim tree limbs or shrubs that overhang or touch buildings.
- Place spring-loaded traps in outbuildings and in other areas where signs of rodents are found. Do not allow children or pets to play near spring traps.

Rodent-Proofing a Home

Rats can enter the home through a hole the size of a quarter. Mice can enter through a hole the size of a dime. Seal gaps and holes inside and outside the home that are greater than a ¼-inch diameter with any of the following materials:

- Cement or cement mortar,
- 19-gauge or greater metal mesh, wire screening, or hardware cloth (¼-inch or less spacing is preferred),
- steel wool,
- heavy-duty caulk or elastomeric sealant, or
- expanding foam.

Cleanup of Rodent-Contaminated Areas or Dead Rodents

Thoroughly clean areas with signs of rodent activity to reduce the likelihood of exposure to germs and diseases. When cleaning, do not stir dust when sweeping or vacuuming up droppings, urine or nesting materials.

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Rising Prices Affect Us All

RAND HOLLON

THREE-dollar-a-gallon gasoline is harder to find than the love in my mother-in-law's heart!

Inflation. Everything costs more.

By definition, inflation is the rate of rising prices and the reduction in the purchasing value of money. In the short term, supply chain issues such as shipping, truck driver shortages, and oil refinery shutdowns can be contributory as the supply for goods is restricted but demand isn't. In hopes of stimulating the economy, longer term inflation can be generated by the central bank — the Federal Reserve.

Although the media focuses largely on the end consumer, you don't have to be a Federal Reserve chairman to realize inflation can also have a grinding effect on small businesses.

In the pest industry, businesses of every size are working to deal with the effects of inflation. Nothing is sacred. Labor, control products, vehicles, fleet and equipment expenses have all seen inflationary increases.

Nothing that I've read agrees on just how high inflation will rise. However, the smart money bets it'll continue to rise through the end of this year.

Inflation presents pest control company owners with plenty to wring their hands about. Most pest companies operate on somewhat limited cash flows. Because cash flows are limited, they don't have the capital to simply absorb higher costs long-term.

Inflation can have a greater effect on their bottom line. Owners can be faced with riding the fence between raising prices or simply eating higher costs. Raising prices can help maintain necessary cash flows, but it increases the risk of losing customers who are obviously faced with their own inflationary pressures.

However, there are numerous ways pest companies can work to fight inflation. Here are three:

1) Review Services and Pricing. Simply raising your prices across the board for the sake of margins may backfire. Take a critical, considerate look at market-based pricing in your area. Review your current service offerings. Identify and develop the services that deliver higher margins. Work diligently to perform more of your most profitable service offerings. Be deliberate about creating opportunities to cross-sell to existing customers. Additional service packages like termite protection, rodent, ornamental pest control, etc. sold to existing customers will work to increase both per-customer value and profitability.

2) Route Density. Now more than ever, every pest business can benefit from tightening their service routes. No one makes money staring through a windshield. Route optimization software is no longer in its infancy. There are plenty of providers and improvements have made these tools much easier to use. Small, tweaking improvements in productivity can make a big difference in company's ability to deal with inflation. For those without routing software, be mindful that improving route density isn't a one-time event — review route structures regularly.

3) Spending. Look at spending overall. What's essential? What isn't? Chances are good you'll discover expenses you can live without, or maybe service contracts with features you no longer use, or don't need. For example, I recently discovered a small premium I've been paying for years that covers service work or replacement of my electric water heater. I've never had an electric water heater. It's gas, and the premium doesn't apply!

Communicate with your chemical suppliers to keep you posted on smart buying opportunities both for products you currently use and alternative products you should consider using.

THOSE are just three things a company can do to create solutions to help offset inflationary pressure. Debt management and streamlining administrative processes through automation are among a multitude of items that may warrant consideration in your business's effort to protect itself against inflation and keep you moving in the right direction.

When choosing which inflation fighting strategies are best for you, it's important to play both offense and defense. PP

Rand Hollon, a graduate of Florida Southern College, is a second-generation pest industry veteran. Preferred Business Brokers has exclusively served the pest industry for 30 years. Working exclusively in the pest industry, Hollon has led transaction processes and brokered pest industry deals throughout the United States and the Caribbean. Over the years, Hollon has also authored M&A-related articles for several pest industry publications and has served as an M&A participant/speaker for numerous local, state and national events.

Rodents, continued from Page 18

Cleanup of Contaminated Surfaces

- Do not vacuum or sweep rodent urine, droppings or contaminated surfaces unless they have been disinfected.
- Wear rubber or plastic gloves if you need to touch dead rodents, traps or rodent droppings.
- Spray rodent urine or droppings with a disinfectant or a 1:10 chlorine solution (1½ cups of household bleach mixed with 1 gallon of water) until thoroughly soaked. Let it soak for 5 minutes.
- Use a paper towel to pick up the urine and the droppings and discard it outdoors in a sealed garbage container. After the rodent droppings and urine have been removed, disinfect items that might have been contaminated.

Cleanup of Dead Rodents

- Check traps regularly.
- Spray dead rodents with a disinfectant or 1:10 chlorine solution (1½ cups of household bleach mixed with 1 gallon of water).
- Wear rubber or plastic gloves.
- Take the rodent out of the trap by lifting the spring-loaded metal bar and letting the animal fall into a plastic bag, then seal the bag, OR place the entire trap and dead rodent into a plastic bag, then seal the bag.
- Place the rodent or entire trap and rodent into a second plastic bag and seal it. Promptly dispose of the sealed double bag in a properly sealed outdoor garbage can.
- Wash gloved hands with soap and water, or spray a disinfectant or bleach solution on the gloves before taking them off.
- After removing gloves, thoroughly wash hands with soap and water, or use a waterless alcohol-based hand gel when soap and water are not available and hands are not visibly soiled.
- If the trap will be reused, decontaminate it by immersing and washing it in a disinfectant or 1:10 chlorine solution (1½ cups of household bleach with 1 gallon of water) and rinsing well afterward.
- Continue trapping for at least one week after the last rodent is caught.

John Moore

- If rodents continue to be a problem, residents should consider contacting a professional pest control operator for help.

Precautions for Building Entry After a Disaster

Damaged or abandoned homes and other buildings may be infested with rodents. If buildings have been abandoned for an extended period of time, it may be helpful to air them out for two to three days before reentering.

If you see signs of rodents, the building will need to be thoroughly cleaned. Contact your local health department for guidance on cleaning in these situations.

Do not vacuum or sweep rodent urine, rodent droppings, or contaminated surfaces that have not been disinfected.

- Spray urine and droppings with a disinfectant or a 1:10 chlorine solution (1½ cups of household bleach mixed with 1 gallon of water) until thoroughly soaked.
- Let it soak for 5 minutes.
- Use a paper towel to remove urine and droppings.
- Discard the paper towel outdoors in a sealed garbage container. PP

Article adapted from CDC Disaster Recovery Fact Sheet, "Rodent Control After a Disaster," https://www.cdc.gov/disasters/rodents.html.

Rice weevil with its exit hole, on rice

Rice weevil, dorsal view

Rice weevil, side view

Rice weevil tunnel in spaghetti, next to mm ruler

Maize weevil on corn

Photos by Lyle J. Buss

Rice Weevils

Lyle J. Buss

AMONG THE BEETLES, weevils are a pretty easy group to recognize by their long snouts. They belong to the family Curculionidae, which is one of the largest families of insects. Most weevil larvae and adults feed on various parts of plants, so very few are pests in buildings. An exception is a group of weevils that feed in stored grains, most notably the rice weevil, *Sitophilus oryzae*.

In many areas of the world, the rice weevil is a major pest of stored grains such as corn, wheat, barley and rice. Its feeding style is described as "internal feeder." This means that the larva completes its development within a single grain kernel.

Since they breed in whole grains and seeds, rice weevils aren't as common in homes as other pantry pests like drugstore and cigarette beetles. But they sometimes show up in homes coming from bird seed, popcorn, or decorations containing Indian corn. Another potential source in homes is pasta, especially old pasta that is caked together. Take a look at the photo of a spaghetti sample, where a larva had bored right in the middle of a 2 mm wide strand of spaghetti.

The adult weevils are 3–4 mm long (⅛ inch). They are reddish brown or dark brown, with four large, orangish spots on their back. The larvae are cream-colored, legless grubs that are seldom seen because they live inside the seeds.

A close relative to the rice weevil is the maize weevil, *Sitophilus zeamais,* and it is found in the southern United States as well. The maize weevil is nearly identical to the rice weevil in appearance, hosts and biology. Therefore, it usually isn't necessary to distinguish between the two species in home situations.

As with most pantry pests, the most important step in management is finding the source. Infested materials should be discarded or frozen, and susceptible foods should be stored in pest-resistant containers. PP

Lyle J. Buss, Scientific Photographer, manages the Insect Identification Lab at the UF/IFAS Entomology and Nematology Department.

Industry Regulation Calls to Action

A letter from Mac Carraway, Executive Director, Environmental Research & Education Foundation, Inc. (EREF)

OVER the last dozen years or so, EREF has been actively involved in responding to efforts by cities and counties in Florida to impose restrictions on how many of us in the green industry do business. Most commonly, we have opposed ordinances banning summertime fertilizer applications, when those bans do not properly exempt licensed, experienced, and BMP-trained industry professionals.

While we have enjoyed some success in past efforts, continuing pressure by activists and their political friends has resulted in fertilizer bans being extended beyond the customary rainy season of June –September (Alachua County), professional exemptions being removed (Orange County), and former holdouts adopting strict summertime bans (Hillsborough County).

Calls to Action

Going forward, it is critical to understand that these efforts will only continue and are likely to get worse — unless you speak up in your own community. It is clear that the most effective defense to these matters has been the result of local voices speaking directly to their elected officials — telling them why we are partners in the effort to keep Florida's waters clean.

The FPMA has been a partner in these efforts from the beginning, and as new assaults come into view, EREF will continue working with your leadership to get calls to action out to you in a timely way. Waiting until the public ordinance hearings is too late — outreach to elected officials and their staffs must start early and in-person to be effective. It's too easy for them to write off organizations like EREF as paid lobbyists. We won't let that happen!

In closing — be on the lookout for these efforts and sound the alarm with your association leadership so they can work with us on efforts to help develop talking points and other tools to represent and support our interests. Good things can happen when you get out of your comfort zone.

So, get involved — personally and financially — in local city council and county commission races to find candidates who will support the science and defend our evidence-based practices. You are their friends and neighbors. And you provide good jobs in their jurisdictions. Finally, if these matters do make it into a draft ordinance, show up in numbers to the public hearing to be seen and heard!

Keep up the good work, and stay turned for further updates from FPMA! PP

LEGISLATIVE *Corner*

Robbie Ringler, Arrow Exterminators Technical Training Director

Legislative Updates

Preemption

We have addressed preemption in the past, as 44 states currently have legislation in place protecting the right of the EPA to regulate pesticide use through the state lead agencies, which in most states is the Department of Agriculture.

SB 3283, called "Protect America's Children from Toxic Pesticides Act," seeks to remove these protections to allow cities, counties, municipalities, tribes, and similar groups to regulate pesticide use in their jurisdiction, which we've addressed before in this column. To say this is unworkable is putting it mildly.

The good news is Rep. Rodney Davis (Ill. R) has introduced a resolution in the House to codify federal pesticide preemption as the national standard and guaranteeing that the EPA and states would continue to regulate pesticide use. Many representatives have signed on as sponsors, and we hope that continues.

This is all a leadup to the 2023 Farm Bill, which gives us time as an industry to gather stakeholders and support for this effort.

New EPA plan

The EPA has published a new strategic plan to address public health and climate change and to advance environmental justice and equity. This effort speaks for itself, but I will point out is that in this four-point plan, the process of pesticide review will be faster and the consideration of effects determinations or protections of federally endangered species will be vastly increased. I'm guessing these efforts are probably not going to work out in our favor.

SORE spot

With apologies to Led Zeppelin, we're going back to California. The state has small off-road engine (SORE) exhaust and evaporative emission regulations. It seems their goal is to ban the use of small, gas-powered engines by January 2024. Good thing that has *no implications* for us — can you imagine no mister blowers, leaf blowers, weedeaters, power rigs? — the list goes on!

The National Pest Management Association, the National Association of Landscape Professionals, and the Pest Control Operators of California (NMPA, NALP and PCOC) are looking to advance tax credits legislation and manufacturer rebate programs to allow industries to transition to battery power. Where will we dispose of all this nickel and cadmium down the road? But let's not get ahead of ourselves.

This legislation will most likely move east from California.

West Virginia legislation

And lastly, the governor of West Virginia has signed WV 4644 into law. This law will eliminate licensing, training CEUs, and insurance for those applying pesticides in homes and businesses that are available in stores for purchase. Sounds like a *great idea* for consumers — not!

The West Virginia Department of Agriculture is working on a reversal or additional rules to lessen the impact. This law, if left standing, will affect industry, the Department of Agriculture, consumers, and businesses throughout their state in ways that that are scary to contemplate! PP

Robbie Ringler is Technical Training Director at Arrow Exterminators

1. Argentine ant trails wore down the house paint

Ant Control, continued from Page 14

We know that proper pest identification can lead to the proper control tactics being chosen. Many pest ants need to be treated differently, and we should focus our inspections on key points based on those identifications. I'm going to inspect and treat a red imported fire ant issue much differently than say a pharaoh ant colony.

Your company should create some basic treatment strategies or best management practices for ants in general as well as species specific steps. We've talked about it and know that identification should be at the top of your service standard steps. This includes a very thorough inspection of the structure. My main focus is to always try and draw the ants to the exterior of the structure. Just because you are seeing ants in the kitchen, doesn't mean it's an interior ant issue. Place your baits on the exterior and draw out the ants.

Here are a few other items that you should address in your standard operating procedures:

- Where should you inspect?
- What products should you use and where should you apply them?
- How should you apply the products chosen?
- Any species-specific information on control?
- Customer recommendations you should make to help reduce conducive conditions.
- Any other pests creating this ant issue?

LESSONS from the field: I once had an account call us back for ants trailing on the inside of the home. Now I will preface that I thoroughly enjoy following an ant trail as far as I can go. One of the quickest ways to ensure you will be returning for multiple call backs is to treat the initial source that the customer complains about and finish up your service in a matter of minutes. You always want to find what I call the root cause of the issue.

As you can see by the first photo, at top left, these Argentine ants were following very tightly linked trails that had worn down the paint on the home.

You can even see evidence that the homeowner was trying to treat these ants themselves.

I was able to follow these trails from inside the kitchen, out a window crack, down the side of the home, over to an adjoining white picket fence, down the fence row about 55 feet, to a patch of bamboo and a fallen tree. This is shown in the second photo, at right.

Bingo! I had found the source of the infestation. If I don't do something to address this moving forward, and only bait within the kitchen, I won't gain any sort of control on the population.

Final step: Proper follow-ups

Instruct your service professionals to educate the customer on proper expectations. Your customers will typically see an increase in ant activity after your service as the ants respond to your bait. If the customer is not aware of this, they might call you back out immediately.

Set follow-up tickets for your service professional to ask the customer how things have improved. Based on the customer's answers, this can dictate when an appropriate on-site follow-up might be needed to reapply and product or continue your inspections.

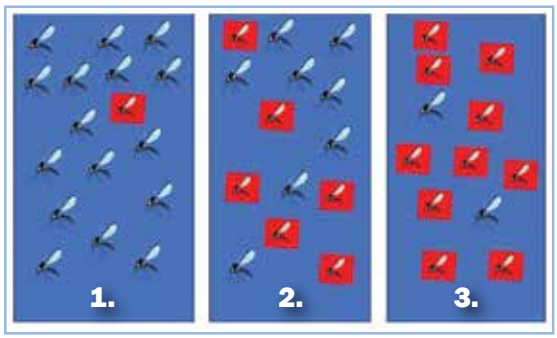
Make sure that you are performing these follow-ups until the ant issue is fully resolved. This will ensure your customers have a great experience with your company in addressing their concerns and you will feel better knowing that the pest issue has been fully dealt with. **PP**

Cory Goeltzenleuchter, B.C.E., P.H.E., a member of the NPMA Technical Committee and the President-elect of the Urban Pest Management Technical Committee, serves as the Entomologist and Director of Technical Services and Operations Support for McCall Service, Jacksonville, Fla. He has a bachelor's degree in entomology from the University of Florida and is an ESA Board Certified Entomologist.

2. The ant trails eventually led out to bamboo and a fallen tree

Without Pesticides, continued from Page 15

To explain pesticide resistance, I'll first define two phrases. The first is *active ingredients*. These are the ingredients in a pesticide product that kill the pest — for example, deltamethrin, cypermethrin or imidacloprid. The second is the *mode of action*, or MoA. This is the physiological disruption at the target site caused by the pesticide. More simply, it's how the pesticide kills the pest — for example, sodium channel modulators, acetylcholinesterase (ACHE) inhibitors, or nicotinic acetylcholine receptor (NACHR) competitive modulators. Insects can avoid the disruption by naturally occurring genetic variation that allows them to alter the target site, or by reducing binding to the target site.



Insecticide resistance occurs when products with the same MoA are used over and over again. The picture of mosquitoes above is an attempt to illustrate this.

1. At first, there is one naturally occurring mosquito that is resistant to the pesticide. The susceptible mosquitoes will die, but this one lives and reproduces.
2. Now more of the population is resistant. If the same MoA is used more of the susceptible mosquitoes die, but again the resistant individuals reproduce.
3. The final result is a population where the majority of individuals are resistant, and this MoA is no longer an effective means of mosquito control.

Modes of Action

What can we do to prevent this? Pesticide applicators should focus on rotating products with different MoAs. The MoAs are very chemistry-based and not all that digestible to your average person. Luckily, the Insecticide Resistance Action Committee (IRAC) has made it easy by assigning a number to each mode of action. Sometimes the IRAC

Continued on Page 30

Justin Dalaba

Non-native snake: Burmese python

Ask IFAS: How Can I Help Protect Native Florida Snakes?

Photo at top: *Invasive Burmese pythons are just one of many large snake species that have found a new habitat in the Florida wilds. Visit https://edis.ifas.ufl.edu/publication/UW484*

FORT LAUDERDALE, Fla. — Non-native snakes in Florida are spreading and growing in population.

Some are considered invasive, threatening Florida's environment, native wildlife, economy and public health, according to scientists at the University of Florida Institute of Food and Agricultural Sciences.

While residents need to be on the lookout for non-native snakes, it can be easy to misidentify them or confuse them with native species. That's why the Croc Docs, a team of scientists at UF/IFAS Fort Lauderdale Research and Education Center, have published *Large Snake Lineup for South Florida: A Guide to Differentiating Between Non-Native and Native Snakes,* in partnership with the South Florida Water Management District. This collaboration is part of a larger initiative to increase detection, reporting and removal of non-native snakes through targeted outreach with public involvement.

The guide includes photos and descriptions of eight key high-risk, non-native snakes and five native snakes. It is one of several tools residents can use to help scientists gather information about the status of these non-native snakes.

"To remove an invasive snake, you first have to detect it, and we are seeking assistance from the public to address the need for more eyes on the ground," said Melissa Miller, invasive species research coordinator for Croc Docs. "This guide will help the public to identify and report non-native snakes in Florida, as well as to distinguish these snakes from several species of native Florida snakes commonly misidentified as non-native."

Residents who spot invasive snakes can report and submit photos through the 1-888-IVEGOT1 hotline and through a smartphone app and website of the same name, Ivegot1.org.

Native snakes can be found in every habitat and are an essential part of the ecosystem. Many native snakes directly benefit humans by reducing rodent populations, resulting in healthy crops and less disease. They also maintain balance in the food web because they are both predator and prey items for native wildlife.

"Invasive large constrictor snakes, such as the Burmese python, pose a serious threat to Florida's native wildlife," said Miller. "Pythons are responsible for severe declines of local mammal populations in the Everglades, and these snakes appear to target wading bird colonies, threatening at-risk species by predation. Meanwhile, pythons have also introduced an Asian lung parasite, which now infects many Florida snakes."

Continued on next page

Native snake: Eastern indigo

Mike Llovet

Snakes, continued

Which is which?

Distinguishing native and non-native snakes can be difficult, making this resource all the more important. For example, the native eastern indigo snake — a large, glossy black snake with orange under its head — has been often confused with a non-native constrictor. Corn snakes and young racers are sometimes confused with hatchlings of pythons. Also, brown water snakes are often confused with pythons due to their choice of aquatic habitat, large adult size and blotched pattern.

"Identification is vital when reporting invasive species, as we want to ensure that our native snakes can thrive and not be disturbed," said Miller.

The non-native species described in the fact sheet include the common boa constrictor and the North African python, which are both established in Miami-Dade County. The Burmese python has established in Miami-Dade and several other counties across the Everglades region. Common boa constrictors have been introduced in many counties, including Broward and Hillsborough counties.

Other non-native species kept as pets, such as the reticulated python, ball python, green anaconda, yellow anaconda, and Dumeril's boa, may pose a threat to native species if they become established in Florida. This is why pet owners are asked not to release snakes and other reptiles into the wild.

Where they are, how to report

Non-native snakes are commonly encountered on roads and levees. They leave long drafts of dust and mud that may not be easy to see. Non-native pythons can be found almost anywhere, so it is important to be vigilant. Often found near water sources including swamps, marshes or open fields, pythons also appear in urban areas, where they have been seen in garages, on boats, in front yards, and crossing high-traffic roads.

"We need the public's help to contain established species such as Burmese pythons and to prevent the establishment of new species," said Frank Mazzotti, a UF/IFAS professor of wildlife ecology affiliated with the Croc Docs.

Be on the lookout for non-native snakes. If you see one, take a picture and report it to the 1-888-IVE-GOT1 hotline, on the app or website. PP

By Lourdes Mederos, UF/IFAS

Facts from FDACS: Reading and Following Pesticide Labels in 2022

IF I WERE to ask you to finish this statement, "The label is the _____ ," most of you could finish it.

That being said, why don't most of the field technicians know what the pesticide labels require?

I submit to you it is because the industry trains most technicians to do what their trainer tells and shows them to do! But does the trainer really know what the pesticide labels require? When was the last time the trainer read the pesticide label?

There is a statement on every pesticide label that states: "It is a violation of Federal law to use this product in a manner inconsistent with its labeling."

That statement is directed to the technician using the product — not the trainer, not their supervisor, not the certified operator in charge, and not the licensee. All the above may be held responsible, depending on the documentation of the training.

MIXING

When doing a label review with a technician, I was NOT surprised to hear him tell me how he mixed the pesticide he was using. He stated that he added water to the tank, then added the pesticide, and then shook it up. When I asked him if that was what the label required, he said he didn't know for sure, but that is what he was told to do!

Another technician told me that he added one-third of the water to the tank, then added the pesticide, and then added the remaining water and agitated it. Unfortunately, neither one of them was correct according to the label of the pesticide they were using.

Get this free miniposter at https://edis.ifas.ufl.edu/publication/IN960

PERSONAL PROTECTIVE EQUIPMENT

For Personal Protective Equipment (PPE) there are two sections on most pesticide labels: one for Worker Protection Standard (WPS), which is Ag, and the other one Non-WPS, which is the structural pest control industry. The Non-WPS section is not as restrictive as the WPS.

I ask a lot of technicians that do L&O if they use Avenue South. Some say yes. Then I ask them if they have a pesticide-resistant apron, and 50 percent say they do not have an apron. Avenue South requires a pesticide-resistant apron to be worn over the regular required PPE while mixing the product.

FDACS REQUIREMENT

FDACS requires you to lock up your pesticide concentrates in unattended vehicle as stated in Chapter 5E-14.106(3). All pesticide concentrates used in the field shall be kept under lock when in unattended service vehicles. They shall be kept in leakproof containers legibly tagged or labeled for identification and providing information required by EPA regulations or recommendations.

EPA REQUIREMENT

One of the most important statements on any pesticide label states: "Keep out of reach of children." If not done, it can be very costly!

Remember, it is your responsibility to know and follow the pesticide labels! PP

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

CLASSIFIED ADS

Without Pesticides, continued from Page 26

number also includes a letter, such as 1A. An applicator doesn't need to worry about the active ingredient or those potentially confusing names of the MoAs — as far as making decisions on rotation.

Just consider the IRAC number, and change that up throughout the season. If in the first application an IRAC No. 3 is used, the IRAC number for the second application should be something other than 3, such as 9B or 1A. IRAC has a great video to describe this process, available in English and Spanish.[1]

Much like IRAC, there is also a Fungicide Resistance Management Committee (FRAC). If you are an applicator who uses fungicides, be aware that the idea of pesticide resistance is not limited to insecticides. FRAC numbers on fungicide labels can be used in the same way as the IRAC numbers to prevent the loss of our fungicidal tools. In fact, there is a resistance action committee for rodenticides and herbicides as well. Resistance matters across the board!

Fighting the Good Fight!

Our pesticide tools are vital resources for managing things like insects, fungi and weeds. There are many great resources out there such as the IRAC[2] and FRAC[3] sites. Additionally, if you are a pesticide applicator in turf there is a UF/IFAS EDIS document just for you[4]!

Remember, if you are applying pesticides, please consider your options and rotate your MoAs using the IRAC or FRAC numbers. A world without pesticides might mean a world without pest management. Be sure to protect these tools, so we can attack our pests, rather than the pests attacking us! PP

Dr. Emily Kraus was born and raised in Indiana. She began her higher education in Entomology at Purdue University. There, she focused on both biological control and medical entomology. She continued on to her M.S. at Kansas State University maintaining her studies on mosquito-transmitted disease. Then she took a break from academia to serve in the U.S. Peace Corps in Senegal, West Africa. Upon her return, she resumed her studies by working in integrated pest management in rice production at Louisiana State Univerisity. While working on her Ph.D. she traveled extensively to rice-producing regions of the world. Her desire for travel carried her through her postdoctoral fellowship at Rhodes University in South Africa where she again studied biological control. This experience set her up nicely for a position with FDACS and subsequently her current role as a UF Extension Scientist for pesticide knowledge and safety at the Pesticide Information Office (PIO).

[1] https://www.frac.info/knowledge-database/videos

[2] https://irac-online.org/

[3] https://www.frac.info/home

[4] https://edis.ifas.ufl.edu/publication/IN714

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