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ON THE COVER

Ever-present in the North Atlantic, the
herring gull breeding range continues to
spread south. Learn how to deal with these
and other gulls found in Florida.

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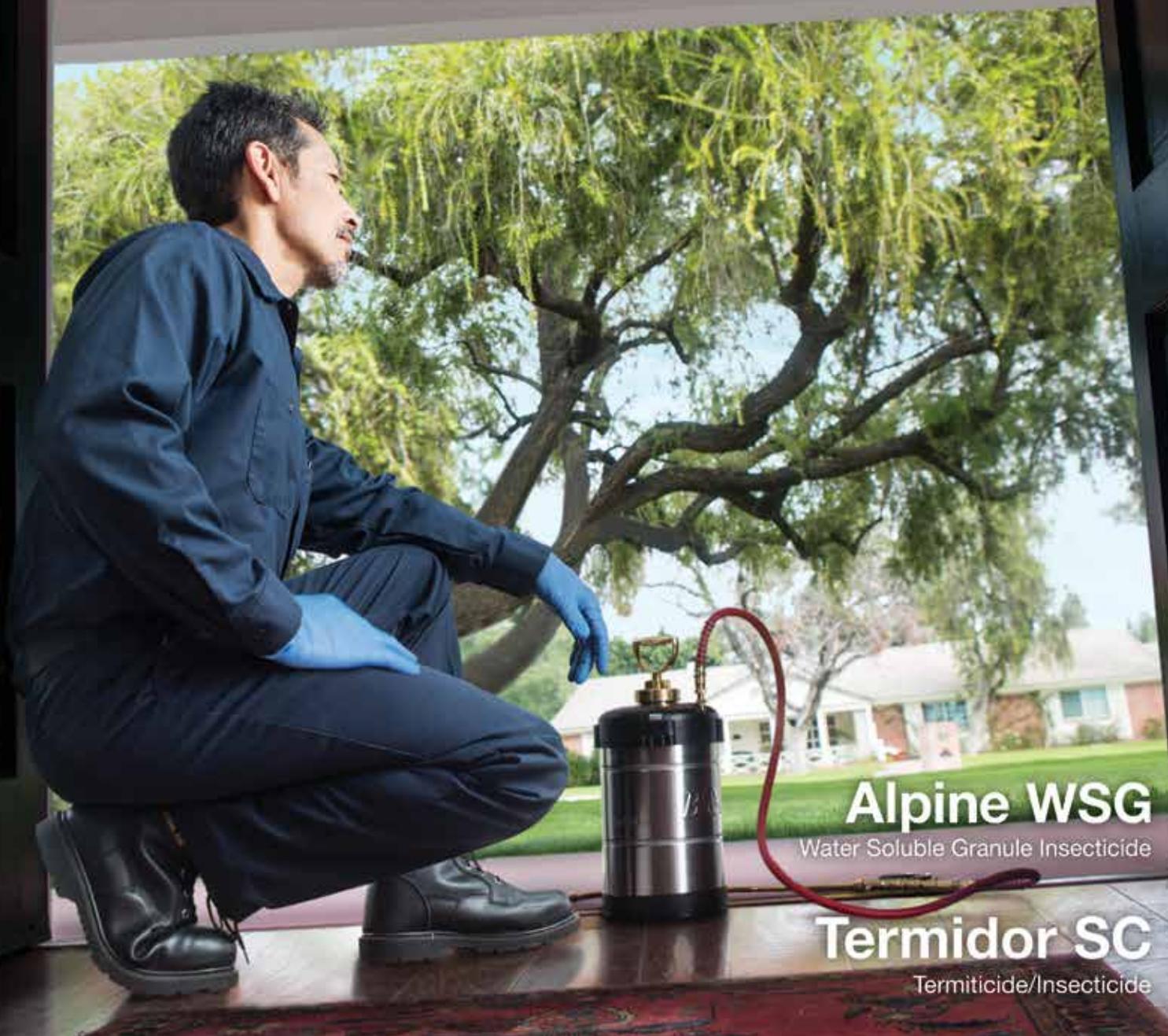
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SUMMERTIME NEWS

Message from the President of FPMA

Anne-Marie Tulp

THE DOG DAYS of summer are upon us — after 27 years of living in Florida it is still my favorite time of year! — and we are six months into my role as president of this great association. Since my inauguration in January, I am proud to say we have accomplished many of the goals I pledged.

Here is an update of how things are progressing:

A monthly e-newsletter to the membership began in March. These short, to-the-point newsletters have hopefully given members insight into what was done over the past month and what's going on next. We end the letter with a listing of new members, so if you happen to meet one of them at a regional meeting or event, be sure to welcome them to the Association!

There have been four Allied meetings so far in 2017. Three have taken place in person: one at the 2017 Expo, another at the Southeast Pest Management Conference in May, and the third at the 2017 Summer Conference in June. A conference call that took place in March brings the total to four. They were all facilitated by your 2017 Allied board member, Marcie Downing, who then reported back to the executive committee with constructive feedback that we have taken steps to implement.

So far there have been three informal board of directors calls on the first Thursday of each month at 4 P.M. They started in March, with an additional in-person board meeting in June at the Summer Conference.

In addition, executive committee members have been assigned four regions each, for the purpose of mentoring and assisting region directors as needed. The EC members then report back to me at our monthly executive committee Skype meetings as to which

region directors they have spoken to and whether there is anything the executive committee can do to better assist these directors.

I continue to make my visits to region meetings a priority. As challenging as this can be sometimes, I am committed to attending them at every opportunity. So far I have attended meetings in Regions 4, 9, and Region 16's "Last Chance CEUs and Vendor Showcase." The latter was the first time an all-day meeting like this has taken place in that region, but based on its success I'm sure it won't be the last!

Business education webinars: I had committed to four in 2017. However, I am pleased to say that we will have met that goal as of 7/12/17 and will exceed it in 2017, thanks to our new FPMA member Alain Parcan at Market Hardware. Alain always follows the webinars up with an accompanying article in *PestPro* (see page 21). As always, advance registration for these informative webinars is mandatory, as this is a "member only" benefit.

In addition, we have had a very busy 2017 when it comes to our events: Legislative Days were March 20–22, AND I am pleased to announce we had a sold-out Summer Conference at Hawks Cay Resort in the Florida Keys June 12–15.

Also in 2017:

One of the tougher projects faced this past year was to find a way to transition from Naylor's *Pest Perspectives* magazine and partner with *PestPro* magazine. I am so happy to say this has happened successfully! This issue makes our fourth publication together, and we are very proud that *PestPro* is

the "Official Magazine of the Florida Pest Management Association." I have received overwhelming, positive feedback with the addition of the Past President's Corner in each issue. It was my mission to reach out to our past presidents and showcase one of them for each issue. They have generously shared words of wisdom that we can all benefit from.

FPMA once again presented the Sapp-Walkup Tailgate Cookout, sponsored by Syngenta, at the Southeastern Pest Management Conference (SEPMC) on the beautiful campus of the University of Florida. Having attended this cookout for the first time this year, I saw firsthand what a well organized and well attended event this is. Hats off to all of you who seamlessly orchestrate this year after year.

FPMA was also pleased to once again provide, through our Foundation, \$500 scholarships to six dedicated and hard-working UF Entomology students. Congratulations to Brittany Campbell, Lettie Cronin, Heather Erskine, Johnalyn Gordon, Richard Murphy, and Britton Simkins.

And last but not least, FPMA's first-ever "Behind the Scenes" Company Tour Day is set for November 3. Six FPMA member companies have all committed to opening their doors to help you grow your own business. Attendees will find this to be a priceless investment. This is also a "member only" benefit. If it is not already sold out by the time you read this letter, it soon will be as space is very limited.

I thank you all for your support and fellowship as we continue to grow together. I wish you all a wonderful summer. **PP**

— Anne-Marie Tulp,
President, FPMA

The Pest Management Industry And the Environment

THE URBAN pest management industry protects the environment and is very concerned about new threats to our environment. Pesticides applied by the untrained public are one of these threats. Invasive plants and animals introduced into Florida from other parts of the world are also threats.

Pest management industry pros are trained to use pesticides responsibly. Many pests that the industry manages are invasive and devastating to Florida's environment. The pest management industry has a lot in common with conservationists and environmentalists.



URBAN LAB HOSTS THE 'PHOTO ARK'

In April, an eminent conservationist paid a special visit to the Urban Entomology Lab. Joel Sartore is a world-renowned, award-winning photographer, speaker, author and teacher. As we prepared for our Southeast Pest Management Conference in May, we learned that Joel was going to stop by our lab and spend two hours taking photos of the insects we rear for research. That two hours in our lab turned into Joel spending three days with us, documenting all kinds of wildlife from Florida.

Joel is a National Geographic fellow and regular contributor to *National Geographic* magazine. He specializes in documenting endangered species and landscapes around the world. He was in Gainesville to take photos for his Photo Ark, a 25-year documentary project to photograph all species of insects and other animals reared by man, ultimately aiming to save species and their habitats from destruction.

While in Gainesville, Joel gave a speech at the Phillips Center for Performing Arts at the University of Florida. The 1,700-seat theater was filled to capacity. "It is folly to think that we can destroy one species and ecosystem after another and not affect humanity," Joel said in part. "When we save species, we're actually saving ourselves."

Soon Joel and the Photo Ark will be the subjects of *RARE: Creatures of the Photo Ark*, a three-part series airing this summer on PBS. The show — "powered by Joel's ability to capture indelible images and by his uncanny eye and dry wit" — follows Joel as he travels



Roberto Pereira (left) wrangles cockroaches for National Geographic photographer Joel Sartore. The UF Urban Entomology Lab hosted Joel and participated in his Photo Ark project in April. Photos by Tyler Jones, UF/IFAS.

the world to document some of the most endangered and rarest creatures left on Earth.

It is because animal species are disappearing at such an alarming rate that Joel wants to take pictures of all species in captivity. As of this month, Joel has 6,531 species recorded in his Photo Ark. He expects the Photo Ark effort to take the rest of his life.

PLANET EARTH: THE BIG PICTURE

Mass extinctions of plants and animals have occurred five times in the past, due to volcanoes and asteroids. The current unprecedented loss of world species is considered the sixth great mass extinction. The rate of animal and plant loss is about 1,000 times greater than rates of extinction in the past. This is due to habitat loss, hunting, climate change, and ever-increasing human populations.

Did you know that there are 133 endangered species in Florida, with nine insects on the list? Most of the endangered insects are butterflies, but there is also a tiger beetle on the list. There are 12 fish, four amphibians, 20 reptiles, 32 birds, 29 mammals, and 36 invertebrates.

In fact, some of the endangered species are in jeopardy partially because of invasive insects. For instance, the imported fire ant has virtually eliminated ground-dwelling animals where it occurs. It has been reported to attack newly emerged sea turtles and ground-nesting mice and birds. The urban pest management industry is

very important in dealing with these ants and other invasive species that are damaging our environment.

Of course, some of the invasive species are squeezing out some of our native fauna. Every week we seem to have several new invasive species enter the state and adversely affect our environment. They may endanger crops or people. For instance, there are about 50 species of reptiles considered invasive established in Florida. Some have been in the news, like the boa constrictor, python, Nile monitor, and the tegu. These are all invasives we fear and dislike.

MANAGING PESTS, DOING OUR PART

The urban pest management industry should pride itself as a protector of the environment. Joel Sartore works to preserve images of endangered and other animals. The pest management industry works to manage pests, many of which are invasive plants and animals. These invasive species are often harmful to humans, and some of them threaten wildlife and endangered species in Florida.

The pest management industry does a superb job of protecting food, health, property, and the environment from pests and pesticides. Our lab is glad to work closely with people like Joel Sartore, who is also doing his part to protect the environment and educate the public. **PP**

— Dr. Philip Koehler,
Managing Director, *Pest Pro*

Mosquito Control

for the Florida Pest Management Industry

Philip Koehler and Roberto Pereira

This past year was a record year for mosquito control by pest management companies throughout the United States.

IN A RECENT ARTICLE in *PCT* magazine, Gary Curl presented the results of his industry-wide survey on the economics of mosquito control in 2016. He reported that 33 percent of pest control companies in the United States offered mosquito control services. That amounted to about 7,000 companies, while municipalities and mosquito districts were represented by only about 2,500 governmental mosquito control providers. Who would have thought that there would be more mosquito providers in the urban pest management industry than mosquito districts?

Mosquito control is especially important in the Gulf Coast states. In the southeastern United States, Curl found that more companies — about 50 percent — provided mosquito control services. In Florida that would amount to about 2,000 pest management companies and locations that employ about 3,500 certified operators and 10,000 technicians. The mosquito control efforts by private companies are quite a bit larger than those provided by mosquito districts.

The public was alerted this past year to the potential of mosquito-borne disease with the presence of Zika transmission by *Aedes aegypti* mosquitoes in Miami-Dade County and three other counties. There was so much media attention to the issue that the advertisers have calculated that national attention was worth

about 160 million dollars of free advertising for mosquito control companies and mosquito products. Is your company ready and prepared to take advantage of this free advertising on the importance of mosquito control?

All About Zika

Zika virus was first discovered in Uganda in 1947 and has since spread throughout the world. Travel-related cases of Zika were reported in early 2016 from Florida as well as almost every state in the United States. Florida governor Rick Scott announced on July 29, 2016, that Florida Zika cases in Miami were the first indication of locally spread Zika in the United States. Of course, Zika is mostly spread from person to person by mosquitoes, even though it can be spread by sex and blood transfusions, as well.

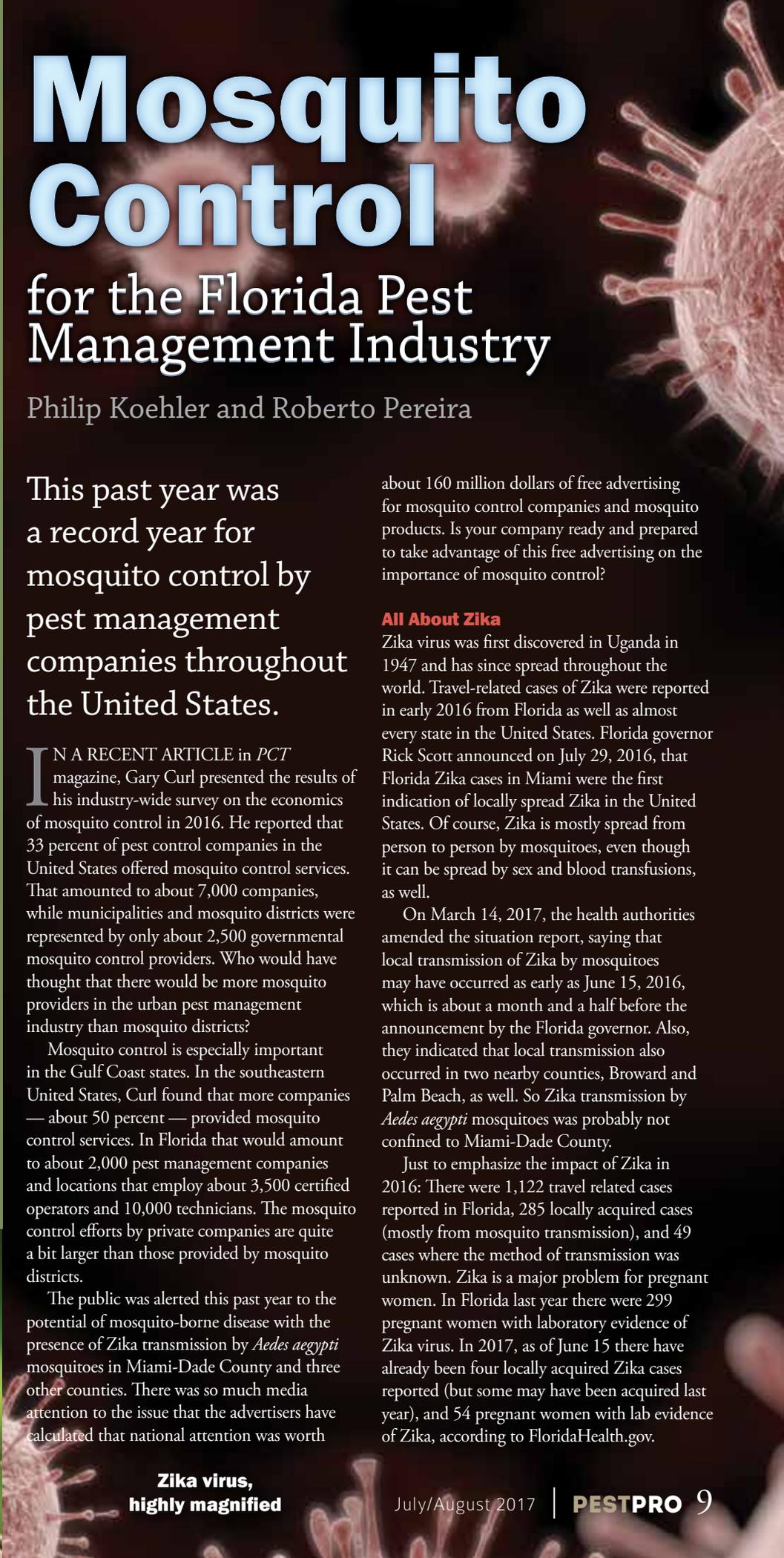
On March 14, 2017, the health authorities amended the situation report, saying that local transmission of Zika by mosquitoes may have occurred as early as June 15, 2016, which is about a month and a half before the announcement by the Florida governor. Also, they indicated that local transmission also occurred in two nearby counties, Broward and Palm Beach, as well. So Zika transmission by *Aedes aegypti* mosquitoes was probably not confined to Miami-Dade County.

Just to emphasize the impact of Zika in 2016: There were 1,122 travel related cases reported in Florida, 285 locally acquired cases (mostly from mosquito transmission), and 49 cases where the method of transmission was unknown. Zika is a major problem for pregnant women. In Florida last year there were 299 pregnant women with laboratory evidence of Zika virus. In 2017, as of June 15 there have already been four locally acquired Zika cases reported (but some may have been acquired last year), and 54 pregnant women with lab evidence of Zika, according to FloridaHealth.gov.

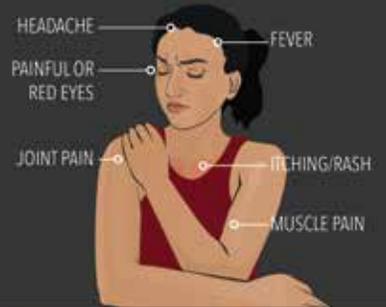
***Aedes aegypti*, highly magnified**



Zika virus, highly magnified



SYMPTOMS OF ZIKA VIRUS



Of course, 80 percent of people who acquire Zika have no symptoms. That makes the disease especially dangerous, because these people go about their daily routine and are bitten by mosquitoes that then transmit the disease to others.

The big problem with Zika is when a pregnant woman gets infected. On April 4, 2017, CDC released a 2016 data summary for Zika in the United States. They reported 250 pregnant women who had lab evidence of Zika and 24 babies born with Zika-related birth defects. That amounts to about a 10 percent chance of having a baby with birth defects due to infection with Zika virus. On April 19, 2017, CDC reported that ArboNet was estimating that in the United States and Washington, DC, during 2016, there were 5,238 pregnant women with Zika. If the 10 percent birth-defect rate held true, then about 500 babies were born with Zika-related birth defects.

All About Mosquito Control

For this year, it is important that *Aedes aegypti* mosquitoes be controlled. They are the prime vector of Zika, as well as Dengue and Chikungunya virus. These mosquitoes are daytime fliers, breed in small containers, and have limited flight distance. The fact that they breed in people's yards and premises makes them an urban pest that can be controlled by the pest management industry.

Florida already has the staff and the contracts on thousands of yards. So it would make sense to use the urban pest management industry to control *Aedes aegypti* mosquitoes in people's yards.

The urban pest management industry can implement a very effective integrated mosquito management program. This program would consist of:

- Customer education
- Inspection
- Treatment
 - > Residual adulticides
 - > Space spray adulticides
 - > Larvicides
- Monitoring
 - > Quality control

Of course, any program should cooperate with local mosquito control districts to assure maximum protection for people. The mosquito program should start with an inspection. When a customer asks for ANY service they should be asked, "Would you like a free inspection for mosquitoes?"

Every technician should do a free container survey as part of service to customers. The easiest inspection to use would be a container inspection at every property. The basic survey unit is the house or premises, where a technician would search for water-holding containers and inspect each for mosquito larvae and pupae. For

Mosquito districts are limited in their ability to control these pests because they do not have the number of technicians necessary to treat all yards in an area. They would have to acquire permission to enter yards. The urban pest management industry in



CONVECTION: Daytime space sprays are not very effective. Convection moves the space spray up out of the mosquito flight zone.



INVERSION: Nighttime treatments keep space spray down in the mosquito flight zone, but Zika vectors fly during the daytime.

a container inspection the search may be ended as soon as larvae are found or continued until all containers have been examined. If a property is has mosquito breeding in more than 10 percent of containers, then a treatment should be recommended. This threshold can be lowered in the case of an epidemic situation.

Treatments may include mist-blower treatments to vegetation to kill resting mosquitoes and flying mosquitoes contacted by the spray, space sprays to knock flying mosquitoes out of the air, and larvicides applied to containers and other areas where mosquitoes develop.

Last year, space sprays were the primary method of killing *Aedes aegypti* mosquitoes that were transmitting Zika. However, in order to be effective those sprays should be applied at night, when there is a temperature inversion. That inversion keeps the space spray in the flight zone of the mosquito and kills flying mosquitoes.

Zika vectors fly during the day, so these nighttime sprays are less effective against them than nighttime-flying mosquitoes. If space sprays are used, they are usually applied when *Aedes aegypti* mosquitoes are not flying. They provide almost no residual control, because usually these treatments kill mosquitoes only when they are flying.

A very effective way of controlling *Aedes aegypti* mosquitoes is to apply a mist-blower insecticide treatment to vegetation and surfaces where mosquitoes rest. We found that these treatments to vegetation could provide up to 60 days of almost 100 percent *Aedes albopictus* control. Although *A. albopictus* are not

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Heat, Drought *and* Insects

*In the Landscape:
What's the
Prognosis?*

THROUGH THE FIRST five months of 2017, Gainesville, Florida, received about 6.7 inches of rainfall — over nine inches below normal. Several cities throughout Florida have experienced similar deficits this year, some even more severe.

During this time many people watched their lawns turn brown, while others tried their best to keep them green. Some people saw their ornamental plants wilt and bake in the sun if left unattended.

Periods of drought like this are concerning for several reasons. Most importantly, water is precious — especially in Florida, where reducing the amount we have while increasing the amount plants need to meet our needs is worrisome. As an entomologist, not only do the effects of drought on natural resources and plant stress come to mind, but I think of how these conditions are affecting insects in our landscapes.

Adam Dale

How does drought affect plant-feeding insects?

Insect behavior and physiology is very closely tied to the environment. To a certain extent, as temperatures warm, insect activity increases. Additionally, there has long been the perception that insects feeding on drought-stressed plants are more successful. Although this may be the case for some, it is not a universal rule.

The general logic here is that stressed plants are less able to defend themselves or compensate for feeding damage. Other evidence suggests that drought-stressed plants are more nutritious to plant-feeding pests, which means that insects feeding on them can produce more offspring and develop more quickly.

However, things are not so clean cut. This lack of “cleanliness” makes plant-insect interactions less predictable, but it also means that insects are not going to devour all our plants whenever we have a drought. That's an upside.

Several folks, including myself, have studied the effects of drought on insect pests over the years, and some general trends have emerged. It turns out that the

Sap-feeders are most likely to benefit during periods of drought.



Aphids



Whiteflies



Mealybugs



Scales

effect of drought stress is very dependent on the type of insect, and some commonalities emerge among insect groups.

Through dozens of studies, sap-feeding insects such as aphids, scales and mealybugs most often benefit from feeding on drought-stressed plants. This means that these insects may develop more quickly, produce more offspring, and survive at higher rates.

On the other hand, chewing pests such as caterpillars and several beetles are typically negatively affected by drought conditions. A third group of insects, borers, show the most consistent relationship with drought stress by primarily targeting drought-stressed woody plants.



Mole cricket and damage in St. Augustinegrass

Photos by Theresa Friday and Lyle Buss, UF/IFAS

Insects in turfgrass

To our benefit or detriment, periods of drought can have a strong effect on turfgrass insect pests. In a previous position, I was conducting research on Japanese beetles, a species of white grub that attacks turfgrasses and ornamental plants. During the first year of the study, we had large beetle populations in our field sites that we could work with. However, that year we had a severe drought and the beetle population virtually disappeared for the next two years. This is because white grubs — scarab beetle larvae — need moist soils to survive and reproduce. Therefore, drought conditions may reduce the abundance and damage associated with white grubs in turfgrass. Contrary to the “benefits” associated with drought conditions, some pests become more difficult to control.

Several subterranean insects prefer moist soils for their development, feeding and reproduction. For example, as soils dry, mole crickets tunnel deeper underground in search for moisture. This can make managing mole crickets more difficult because insecticides do not penetrate the soil to reach mole crickets when soils are dry.

Other research has suggested that mole crickets prefer to fly when the air is moist, which suggests that mole cricket flight activity and movement may be reduced during periods of drought. My lab is conducting research to address questions associated with weather conditions so that we can better predict how these insects change their distribution and behavior during different weather events.

Southern chinch bugs are sap-feeding pests, which means they have a mouthpart resembling a hypodermic needle that they use to tap into plant tissues and feed on sap. As I mentioned previously, sap-feeding insects

Continued on Page 14

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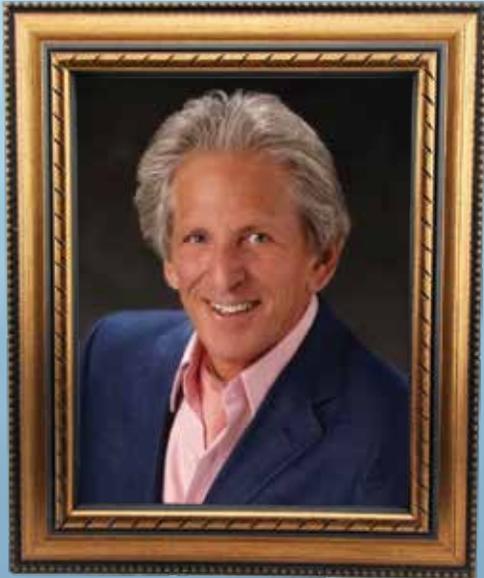
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Name: Steven Tendrich

Hometown: Miami, Florida

Where you live now: Jupiter, Florida



Steven Tendrich

About your company: I was in the pest control business for 20 years. It all started when I was on summer break from college. I went to work for my girlfriend's father, who was in the pest control business. I ended up marrying her and went to work full time for him from 1960-1975. I then went on to home building and other businesses.

First paying job, and what you learned from it: National Pest Control, where I started as a trainee and eventually became a partner. I learned that hard work pays off and that in business you have to learn to be creative and think outside the box. My first creative risk was when I asked my father-in-law for \$5,000 so we could

start advertising on TV. He said yes, but he never gave the \$5,000. There were three local stations in Miami at that time so I stacked the advertising on all three. Basically, by the time the bill came due for the first station, I had received enough business from all the advertising on the other two stations to pay for the first, and so on.

First break in the pest business: When my father-in-law decided to retire, and I continued on my own. My father-in-law was getting up in age and wanted to retire, while I wanted to grow the business. At that time we had three offices, and the two new ones were not doing well. We sold the Miami office — which was doing great — to Terminix, and he received enough money to retire. I took the two others, turned them around, and built from there. Eventually, I sold 14 offices to Rentokil in 1980.

Best business book: *One-Minute Manager*.

Best piece of business advice you received: You need to love what you are doing.

What you would tell someone new to the pest business: Inspect what you expect.

Where can we find you when you are not at the office? On my boat.

What is the most important trait you look for when hiring? Someone that has not had a lot of jobs. **PP**

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Southern chinch bugs and their damage in St. Augustinegrass

Grass photo, Tom MacCubbin

tend to benefit from drought-stressed plants. The southern chinch bug is one of these, and the most damaging insect pest of Florida lawns. Therefore, as periods of drought occur or progress, it is critical to keep an eye on St. Augustinegrass lawns so that populations do not increase beyond control. This can be challenging because chinch bug damage resembles drought stress, which makes active monitoring even more important. Minimizing turf drought stress as much as possible or implementing control measures is critical to manage these pests.



Insects on ornamental plants

Symptoms of drought stress typically appear more quickly in turfgrasses than woody ornamentals. Woody plants are also subjected to this drought stress, but are better equipped to tolerate it because they can survive on the nutrient reserves they have stored away. This makes woody plants very resilient, but also difficult to manage because sometimes we cannot easily observe signs of stress until the stress has been prolonged. Insects, who are much more in tune with the plant's biology and stress level, can respond to this stress before we even realize it has occurred. As a result, we often enter the situation once drought and pests are taking a toll on the plant.

Again, among insect pests, sap-feeders are most likely to benefit during periods of drought. This includes groups like scale insects, aphids, whiteflies, and mealybugs. Current research in my lab is investigating the effects of temperature and drought on urban trees in Florida and up the east coast. Over the next three years, we will be manipulating the level of drought stress in these trees and measuring its effect on plant-feeding pests. Our goal is to better understand this relationship so that we can develop IPM strategies that increase tree health and reduce pests that attack them, especially during stressful periods.

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How can we mitigate these effects?

Ultimately, mitigating the effects of drought or heat comes down to proper preventive cultural practices. Plants must be set up for success from the beginning if they are expected to survive during stressful times. In most cases, if the right plants are being used for the site and they are being maintained appropriately, plants should be able to tolerate or compensate for insect feeding.

The recent Florida drought is an excellent example of how cultural practices can set up a

landscape for failure or success. Individuals who resisted the need to irrigate their lawns may have ended up battling other issues like southern chinch bugs. Although these forces are often out of our control, lawns that were dense, green, and vigorous prior to the drought most likely encountered fewer additional challenges.

An important note for landscape management — and perhaps in life — don't overcompensate. Although too little water is bad, too much water can be equally so. Not only can disease come into play with too much moisture, but insects may also respond. For example, bark beetles are attracted to drought-stressed and over-watered trees. A research project that I worked on found that over 80 percent of water-logged nursery trees were attacked by bark beetles, while less than 15 percent of unstressed trees were attacked. This is because water-logged trees release ethanol in response to this stress, which attracts wood-boring beetles. Therefore, it is critical to maintain a balance with cultural practices.

Scientists predict that periods of drought will become more frequent and severe in coming decades. To address the challenges associated with drought stress and future landscape management needs, UF/IFAS is conducting several research studies to identify more drought-tolerant turfgrasses and IPM tactics for maximizing urban landscape plant health. In addition, my lab is evaluating multiple new turfgrass genotypes for resistance to southern chinch bug, which could provide an additional tool for reducing damaging chinch bug populations that result from plant stress.

If drought conditions persist, consider the stress levels of turf and ornamental plants in your landscapes, and keep an eye out for the insects that may respond to that stress. If the rainy season brings much needed precipitation, track the irrigation and management of these plants to ensure they are healthy and able to tolerate or defend against pests. These efforts and results depend on active monitoring for plant stress and pests, while using appropriate cultural practices to promote the system's overall health. **PP**

Dr. Adam Dale can be reached by email at agdale@ufl.edu or by phone at 352-273-2976. Resources that further explain content discussed here can be found at <http://edis.ifas.ufl.edu> or dalelab.org.



ENSIGN: a type of maritime flag that identifies a ship's nationality



Actual size



This species of ensign wasp is our ally in the war against roaches

Wasp photo by Lyle J. Buss

'Roach Hunter'

Lyle J. Buss

WHEN I THINK OF INSECTS that are found in buildings, some things that come to mind are ants, termites and cockroaches. But what about wasps? Usually I think of wasps living outside, although in Florida lots of different critters may wander into homes. But here is a wasp that is mainly found indoors, and it's not a bad bug, either. This is *Evania appendigaster*. It's common name is easier to pronounce — it is a type of ensign wasp. It gets its name from its relatively small abdomen, which is attached to the thorax by a thin segment that enables it to be waved around like a flag, or ensign.

The interesting thing about ensign wasps is that they attack cockroach egg cases, or oothecae. That makes them a beneficial insect in most people's opinion. This particular species is black with clear wings and is about ¼ inch long, which makes it one of the larger species in the ensign wasp family. Its long legs make it look even larger, and at first glance, some people mistake it for a spider.

Ensign wasps parasitize cockroach oothecae, and since this is one of the larger species, it needs a big ootheca in which to develop. Its favorite host is the American cockroach, *Periplaneta americana*. Another host is the Australian cockroach, *P. australasiae*, which also commonly invades homes and garages in the Southeast. The female wasp lays a single egg in a roach ootheca, and the larva will eventually kill all of the roach eggs as it grows. Unfortunately, this wasp species is too big to utilize the oothecae of German and brown-banded roaches.

This wasp probably originated in Asia and has been transferred around the world along with the roaches. It is commonly found in urban areas and in buildings, but it doesn't seem to occur outdoors in natural environments. Homeowners don't need to be worried about these wasps, as they don't sting or bite people or pets. However, if many of these wasps are being found, it may indicate that there are a lot of large roaches present. **PP**

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

Common Florida gulls in winter plumage, from left: Laughing gull juvenile, Bonaparte's gull, herring gull adult, herring gull juvenile, and great black-backed gull.



Sea Gulls of Florida

William H. Kern, Jr.

Gulls of Summer ...

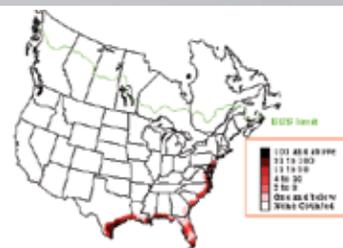


Laughing Gull *Leucophaeus atricilla*



The **laughing gull** is the only gull normally seen in Florida in the summer (above). Its black head and raucous call makes its presence obvious. Their nonbreeding plumage in winter is very different, with most of the black missing from the head and only a gray "smudge" present behind the eye (photo at top left).

They are medium-sized gulls at about 16 inches long, or two-thirds the size of a herring gull. They are distinctly coastal in habits, except when visiting landfills. Their breeding range and winter range is basically New Jersey to Texas, along the Atlantic and Gulf coasts.



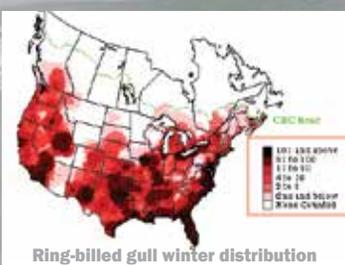
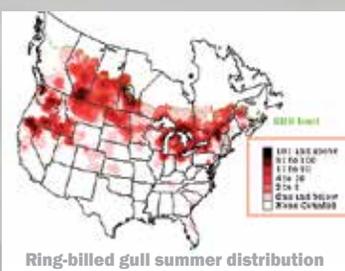
And Winter

Ring-billed Gull *Larus delawarensis*



The other abundant gull in Florida during the winter is the **ring-billed gull** (above). Most people know it as the parking-lot gull of late fall, winter, and early spring. They breed along freshwater lakes and rivers in the central and northern United States and southern Canada.

Some ring-billed gulls migrate south to Florida and the Gulf Coast states in fall to avoid the worst weather of winter. Because they are associated with freshwater, they probably eat more insects than saltwater gulls.



WITH FLORIDA'S long, elaborate coastline, one would think we would support lots of gull species — but Florida summers seem too warm for most gull species. Other species like terns, skimmers, pelicans, cormorants and frigate birds seem to fill that niche in Florida and the Caribbean.

Gulls are smart, opportunistic and effective predators, scavengers and thieves. They eat almost anything: fish, crustaceans, mollusks, birds' eggs, baby birds, baby sea turtles, marine worms,

food scraps, garbage, and any kind of carrion.

Gulls are notorious for harassing other birds to make them drop their catch or even disgorge their stomach, then swooping in to steal the ill-gotten booty. Because they are smart, numerous and bold, they often cause nuisance situations that require pest management. They are also protected by the International Migratory Bird Treaty Act, which can limit control options.

Name	Status in Florida	Distribution
Laughing gull <i>Leucophaeus atricilla</i>	Permanent resident	Abundant year-round in Florida
Franklin's gull <i>Leucophaeus pipixcan</i>	Accidental	Western North America in summer
Little gull <i>Hydrocoloeus minutus</i>	Rare/accidental	Middle Atlantic states in winter. Great Lakes in summer
Black-headed gull <i>Chroicocephalus ridibundus</i>	Rare/accidental	New England and Middle Atlantic states
Bonaparte's gull <i>Chroicocephalus philadelphia</i>	Winter migrant	Breeds in Canada and Alaska. Winters along US coast to Mexico and Greater Antilles
Heermann's gull <i>Larus heermanni</i>	Rare/accidental	Pacific coast
Ring-billed gull <i>Larus delawarensis</i>	Winter migrant	Abundant inland species
California gull <i>Larus californicus</i>	Rare/accidental	Pacific coast species
Herring gull <i>Larus argentatus</i>	Winter migrant	Common coastal
Thayer's gull <i>Larus thayeri</i>	Rare/accidental	Arctic in summer, Pacific in winter
Iceland gull <i>Larus glaucooides</i>	Rare/accidental	Arctic in summer, New England and Canadian maritime in winter.
Lesser black-backed gull <i>Larus fuscus</i>	Accidental	European species
Slaty-backed gull <i>Larus schistisagus</i>	Rare/accidental	Alaska and Siberia
Glaucous gull <i>Larus hyperboreus</i>	Accidental	Arctic in summer, Northern coastal Atlantic and Pacific in winter
Great black-backed gull <i>Larus marinus</i>	Winter migrant. Less common than herring gulls	New England and Canadian maritime in summer, southern Atlantic and east coast of Florida in winter
Sabine's gull <i>Xema sabini</i>	Rare/accidental	Arctic in summer, southern hemisphere oceans in winter

Nuisance control

The problems caused by gulls are mostly due to their fondness to be around humans and take advantage of all the food we discard, or our activities that can supply food. One of the main nuisance situations with gulls is their roosting and loafing on boats and buildings. Attempts to discourage them include devices that swing around and touch them or startle them with moving reflectors (1).

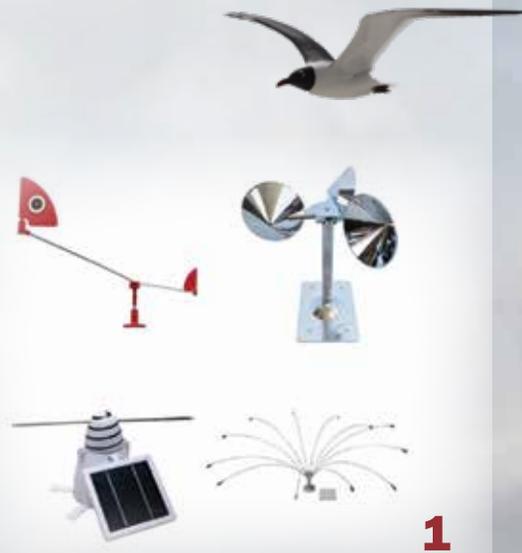
Methods to deter roosting on flat surfaces include porcupine wire or spikes, coils, electrified tracks, slanted platforms, and wires to prevent comfortable roosting (2).

Humans have used effigies to scare and drive away pest birds for thousands of years. Modern effigies include kites, plastic models, and even robots, but they are only effective if they have a startling effect (3).

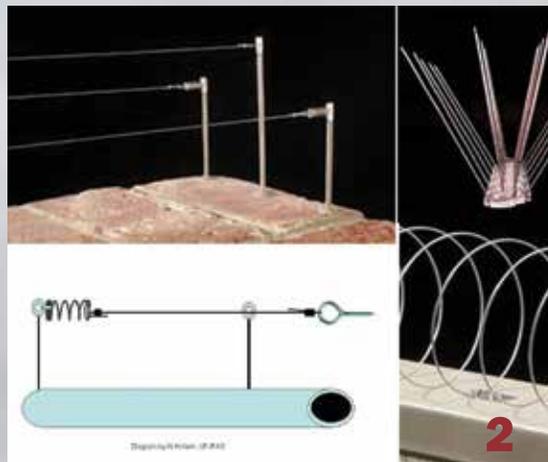
For large-scale problems like landfills or airports, pest control pyrotechnics, such as bird bombs, screamers, shellcrackers, shotgun blanks, fuse crackers, and propane exploders, are useful, especially in combination with lethal shooting. Lethal control requires a US Fish and Wildlife Service "Take" Permit prior to any shooting of birds.

Possession and use of exploding pest management devices requires a license from the Bureau of Alcohol, Tobacco, and Firearms, and materials must be stored in a Type 1, 2 or 4 magazine. For technical assistance, contact the USDA Wildlife Services state office in Gainesville, Florida.

Birds of prey are becoming a widely used tool for moving or dispersing gulls and other flocking pest birds. Hawks and falcons are especially useful when dealing with bird flocks that are not moved by other techniques. Some ingenious folks have even developed falcon-shaped radio-controlled drones for bird harrassment (4).



1



2



3



Take-home message

1. Laughing gulls are the only gulls you are likely to see in Florida in the summer.
2. Ring-billed gulls come to Florida in the late fall and leave in the spring. These are our winter parking-lot gulls.
3. Gulls are smart and learn quickly, so one control option will rarely work for long.
4. Gulls are protected and require US Fish and Wildlife "Take" permits before lethal control is attempted. Nonlethal harrassment must be tried before permits are usually issued.
5. Pest control drones may be useful in the future to supplement falconry for bird control. **PP**

William H. Kern, Jr. is Associate Professor of Entomology at UF/IFAS Ft. Lauderdale Research and Education Center.



Robird falcon drone

4

◀ **FLORIDA'S GULLS** Gull species reported in Florida. Compiled from the Official Florida State Bird List of the Florida Ornithological Society, the Audubon of Florida Checklist of Florida Birds, and the Florida Fish and Wildlife Conservation Commission 2016 Checklist of Florida's Birds. This list is not complete. There have been several sightings of single individuals that are not likely to be repeated and were not included here.



Tony Hughes

If you would attain to what you are not yet, you must always be displeased by what you are. For where you were pleased with yourself there you have remained. But once you have said "It is enough," you are lost. Keep adding, keep walking, keep advancing; do not stop, do not turn back, do not turn from the straight road.

~ Saint Augustine

SAINTE AUGUSTINE wrote these poignant words over 1,600 years ago. Like all gems of wisdom, time has not diminished their worth. One could say that Tony has done his best to emulate these words, which leads us to his fascinating story of the roads that led him to U.S. Navy entomology.

For his entire life Tony has been fascinated with animals of all sorts. His parents say that even as a toddler Tony was particularly drawn to insects and spiders.

Before long he was capturing and raising these critters at home, much to the chagrin of his parents. For some reason Tony's mother didn't like the black widows in his bedroom.

It was in first grade that Tony learned of a field called zoology, and he was hooked. To study animal behavior was a goal of his all the way through, even into his first year of college.

It was in that first year of college, though, that he began to question his professional goals. Tony recounts how more than a few expressed the opinion that good zoology jobs were few and far between, and that the pay was lousy to boot.

There was also the fact that Tony had literally fallen in love at the tender age of 20. He would be married one year later at the age of 21. Thus began a foray into other areas. Tony dropped out of college, embarked on a journey into the military, and somehow found himself, years later, back into the world of animals.

An Officer, a Gentleman and an Entomologist

Q&A with Tony

Considering the diversity of your background and experience, how did you get into entomology?

To make a long story short, not too long after high school, I was an active-duty Army infantryman for about four years. I then spent one year as a medical technician in the Wisconsin Air National Guard, followed by two years as an Air Force ROTC cadet, then three years as an active-duty Air Force intelligence officer — and now nine years as an active-duty Navy entomologist.

As Dr. Koehler so colorfully puts it: The Army figured out I couldn't shoot, the Air Guard took note of the fact that I was afraid of needles, the Air Force was utterly dismayed to learn that I hated to fly, and isn't military intelligence an

oxymoron? — so, lo and behold, old interests never die, and the Navy took me on for bugs.

Jokes aside, I became aware of military entomology while an Air Force ROTC cadet at the University of Kentucky in 2001. My jaw hit the floor when I learned of the potential to continue to serve in the military and study insects.

I immediately began to pursue the course. Who would have guessed that it would take five years to get an opportunity? I left the Air Force in roughly 2005 and was selected by the Navy under the health services collegiate program to earn a master's of science in entomology at the University of Wisconsin. Believe it or not, this was the same school that I had dropped out of in 1993 in order to get married, mature and join the military. Some say history is circular.



Photo, far left: Tony's deployment to Helmand Province, Afghanistan. The wooden stand was fashioned to support mosquito surveillance traps.

Immediate left: Tony with a column of driver ants in Liberia, Africa. There are hundreds of thousands of ants moving through the furrow.

Below: Tony next to a termite mound in Liberia.

military and war-time environments. This includes pest control on an aircraft carrier all the way to mosquito control for Marines in Africa.

I spent four wonderful years at NECE. Highlights of this tour were participation in New Jersey with Rutgers, mosquito control district research on eradication efforts of the Asian tiger mosquito, and three trips to Liberia to assist with research on the ecology of mosquito vectors of malaria.

NECE develops the programs that certify enlisted preventive medicine technicians and officer entomologists for pesticide application. I was given the opportunity to teach and train hundreds of technicians and fellow colleagues.

The Navy transferred me to the Navy and Marine Corps Public Health Center [NMCPHC] in 2012. NMCPHC is the Navy's version of the Centers for Disease Control [CDC]. I worked alongside engineers, epidemiologists, industrial hygienists, biochemists, dietitians, environmental health experts, and a hodge-podge of civilians dedicated to improving public health for the Navy and U.S. Marine Corps. It was a higher-level headquarters job, and the learning curve was steep. The highlight of this tour was spent managing the equipment, training and evaluation of our deployable vector-control teams. From there, I was selected to earn a Navy-funded PhD in entomology, which led me to Dr. Koehler and UF.

It has been mentioned that UF wasn't your first choice of programs, but you ended up a Gator. Why and how did that happen?

I am a huge sports fan, to include a lifelong history of watching and playing sports. What I am about to say may seem odd to some, but growing up in Wisconsin and earning degrees

What did you work on at the University of Wisconsin?

At UW-Madison, I conducted research on West Nile virus [WNV] and avian malaria in two mosquitoes, *Culex restuans* and *Culex pipiens*. At the time, there was much debate about bridge vectors of WNV in the Midwest. In addition, there was past research demonstrating that mosquitoes coinfecting by multiple pathogens could experience an increase or suppression of the ability to transmit disease.

Wisconsin has several species of avian malaria, and we were curious to observe how many WNV vector mosquitoes might be coinfecting with both pathogens. As it turns out, we documented that some mosquitoes were potentially infected with at least three single-cell parasites and WNV at the same time.

We also conducted research as to which of our two primary WNV mosquito vectors were most attracted to humans. During my studies, I was also the first in the state to document the presence of the exotic mosquito *Aedes japonicus* in Wisconsin.

Having finally attained your goal of becoming an entomologist, what did the Navy have in store for you?

As is par for the course, the Navy sent me to the Navy Entomology Center of Excellence [NECE], located on Naval Air Station-Jacksonville. The Navy Entomology Center of Excellence is unique in the Department of Defense. This command is entirely devoted to operational entomology. In other words, NECE evaluates and conducts all the training, tactics, and techniques necessary to conduct pest and vector control in a variety of



the Universities of Kentucky and Wisconsin lent to my admiration of the Big 10, Big Blue, and a natural dislike of big NCAA Florida athletic programs, i.e., Miami, FSU and UF. I can hear it now, "Tony was a hater of success"! Needless to say, I was blessed to be offered acceptance into a number of entomology programs.

All that aside, close mentors and my wife called me on the carpet about my avoidance of Florida. Not to exaggerate the matter, but UF's entomology department dwarfs most in terms of opportunities for graduate students. The department's reputation precedes itself.

More importantly, one would be hard-pressed to ever approach Dr. Koehler's history of success in mentoring and developing military entomologists, having been a former Navy medical entomologist himself in the Vietnam era.

Dr. Koehler's Urban Entomology Lab is a world leader in its own right. I had a lot of medical entomology experience, but what I learned in Afghanistan under my deployment with the USMC was that I lacked fundamental applied entomology experience. I literally spent more time managing filth flies, ants and rodents than I did on sandflies and mosquitoes. I evaluated 14

contract entomologists in Afghanistan and learned to deeply respect pest control and the industry.

Another huge variable that contributed to my choice to become a Gator was Dr. Roberto Pereira. Dr. Pereira had great interest and experience in ant research. I wanted to study ants, so it was a natural fit. It wasn't until more than year into the program though that I actually wore UF gear and did the Gator chomp. Oh, well!

So now that you are working with ants, what are you doing researchwise?

Ants are one of the most successful animals on earth. They are also one of the most routine pests encountered in a variety of habitats. Florida possesses amazing ant diversity, and probably has the most exotic (introduced) ant species in the United States. Dr. Koehler is truly a jack-of-all-trades, and was receptive to some ideas that I wanted to explore with ants.

My current research looks at how ant communities respond to habitat condition and management, and how stable ant biodiversity is over time. UF is fortunate to possess some great research areas in the state. We are currently conducting research at the Ordway-Swisher Biological Station in Melrose, Florida. Ordway is a beautiful area with over 11 pristine Florida habitats ranging from sandhill pine to basin marsh. Ordway also is home to over 100 documented species of ants. Lastly, we are characterizing ant communities in Florida habitats that have not been sampled before.

What's next after UF and your PhD?

As a member of the military, one mixes desire with the requirements of the service. My family and I will go wherever the Navy sends us. Depending on availability, the Navy tries to send recent PhD graduates to domestic or overseas research centers.

If it were up to me, I would choose to go to the CDC in Atlanta to work with mosquitoes and malaria, or stay in Florida and take a higher technical leadership role at NECE in Jacksonville. No matter where the Navy sends us, I'll fit in some projects with those ubiquitous creatures called ants!

As the most mature student in the lab – aka the oldest – what occupies your time outside the lab and field?

This is the easiest question of the interview. The clear and easy answer is my family. I have been married to a great woman that tolerate bugs for 23 years, and we have two children, ages 9 and 14, with hopefully more on the way. We stay very busy with our church, kids' school, youth groups, sports, and traveling. The Navy has been great to us, and we are having fun with the experience of being a military family. The future looks bright as well. As an entomologist, it sometimes feels like you never have to grow up. **PP**



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**Kyle Covington, working on Turf Maximizer,
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Three Reasons Why Your Business Needs to Send an Email Newsletter

Alain Parcan



SINCE ITS INTRODUCTION, email has evolved from an efficient form of online communication to its modern-day incarnation where more than half of what you receive is marked as “spam” or “junk.” It’s easy to see why businesses choose to ignore the idea of using email as a form of marketing.

However, done correctly, email newsletter marketing provides a simple and unique way for pest control professionals to reach a wide audience with minimal work on your end. And, the pay-off is a consistent form of “touching base” with customers who will fuel your sales and growth in 2017 and beyond. As the marketing rule of thumb goes, “it’s easier and cheaper to sell to existing customers than to new customers.”

Here are the three reasons why your business needs to be sending an email newsletter:

1. It is the simplest and most effective way to stay in touch with your client base

This is the number-one reason to start sending out an email newsletter if you haven’t already: Email newsletters are not only sent instantly, but they are extremely affordable. Investing in new marketing tactics can be hard to justify when the outcome is uncertain, but the affordability of an email newsletter makes this strategy a no-brainer. Chances are you already have a list of your client’s email addresses, so start putting them to use. Sending out an email to your clients each month costs mere pennies per message, making it less expensive than reaching your customers through television, radio ads or even direct mail — with a higher return on investment. The best part is your email newsletter can be customized to all devices so your customer sees a clean, professional version on their mobile device, tablet or computer.

2. It keeps your business top of mind

As a pest control business, your clients won’t call until they require your services. Even

during your busiest seasons, there is only so much you can do to impact when those calls for service will come in. Even when you’ve provided excellent service to your customers, you may still be overlooked when a competitor offers a deal your customers can’t pass up.

Sending out an email newsletter will keep your business top of mind so when your customers are in need of your services, you’ll be the first person they think to call. Filling your newsletter with pest control information and tips can also help to build trust between you and your client base and reaffirm your position as a top service provider in your area.

3. It allows you to promote special offers and coupons

Adding coupons to your website and signs to your storefront might entice customers and prospects, but you want to ensure that you’re able to reach your entire audience in one fell swoop. While we recommend keeping your email newsletter 90 percent educational, you should include a promotion recipients can claim during their next service call or appointment. A small offer is a great way to show your customers you value their business, and sending it out through your email newsletter will ensure all of your clients and prospects will be able to take advantage of it.

Email remains a great way to reach your customers, and a monthly email newsletter will help your pest control business remain an industry resource and trusted provider to your clients. Not sure where to begin? All you need is a list of email addresses and a reputable web marketing company to help get you started, if you don’t have the time or knowledge to do it yourself.

If you have any additional questions on email newsletter marketing and how to start a campaign, give us a call today. **PP**

Alain Parcan, Director of Marketing for Market Hardware, Inc., contributed this article. Alain brings nearly 10 years of experience in educating businesses so they can market themselves more effectively. Market Hardware helps small businesses compete on the web and offers special discounts for professional association members. You can reach Alain’s team at 888-381-6925.

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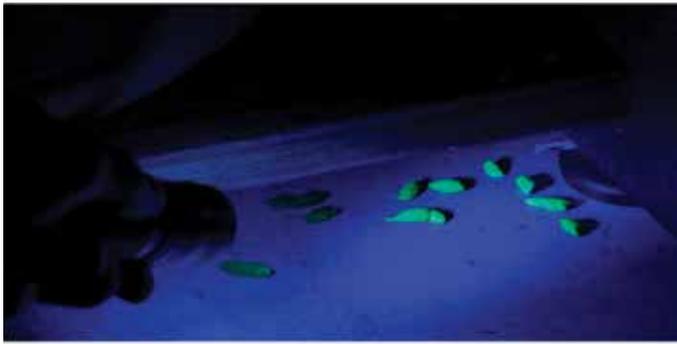
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Mystery Monster Nest Found in Florida

AT *PESTPRO*, we know that insects thrive in Florida. Arthropods of all kinds love our special combination of sun, heat and humidity — luckily for us.

Recently, a living monument to that old adage was discovered in the heart of Florida. *PestPro* readers, feast your eyes on a tower of pure insect power.

How many years of how many chewed-up bits of wood pulp and wasp spit went into this feat of arthropod architecture? What countless hordes of stinging insects lurk inside? And why is that man standing so close?

No one may ever know. But we have a pretty good idea which insects built the monster nest.

Sarah Nelson, an environmental consultant and UF graduate, said that the nest was found by a landowner in a conservation area near Green Swamp. “Large areas have been untouched for at least the last 100 years or so due to access issues,” Nelson said.

“Recently, since everything has been so dry, we have been able to get to these parts of [the owner’s] property and found this thing. I have never seen anything like this before, and in all of his 50 years in Florida, he hasn’t either.” Nelson contacted the pros.

Jamie Ellis, director of the Honey Bee Research and Education Lab in Gainesville, said, “This looks like a huge yellow jacket nest to me. I say that because it starts at the ground and seems to grow upward, rather than the other way around.”

PestPro’s own Phil Koehler agrees: “This is probably a *Vespula squamosa* nest” — southern yellow jackets.

Word has it the landowner plans to leave the monster nest alone. Koehler said, “It is a great size nest that is going to be preserved as part of nature.” **PP**

— Jane Medley, *PestPro* magazine



**Southern yellowjacket
wasp queen**

Mosquito Control, continued from Page 10

considered the primary vector of Zika, *A. aegypti* are also controlled. Therefore, we are repeating those experiments in Miami-Dade and Broward counties this year on *Aedes aegypti* mosquitoes. These treatments to vegetation can be applied at any time of day because of the residual properties of the chemical.

One concern about vegetation treatments is that only pyrethroids are registered for these treatments to vegetation. *Aedes aegypti* mosquitoes have been shown to have pyrethroid resistance in Florida and other states. So there is concern that these vegetation treatments will fail. However, WHO resistance assays may not determine whether the level of resistance detected would result in mosquito control failures.

Also, many of the assays have been to determine levels of resistance to permethrin, so other pyrethroids, like lambda-cyhalothrin or deltamethrin, may not exhibit resistance in those same mosquitoes. WHO says, "In some cases, vector control strategies in a given area may not be affected by the level of insecticide resistance" that was detected. Therefore, the bottle assay does not prove that a product will not work in the field. Additionally, because of the limited flight range of these mosquitoes, the area of the detected resistance may be limited to a very small area.

Mosquitoes should be monitored after treatments to assure that control has been



Eggs appear at waterline

achieved. This can be done using a cup with water and a wooden tongue depressor (see photos above). By weekly checking the sticks and counting the mosquito eggs, effective control can be documented. Of course, water in the cups should be emptied weekly so they do not breed mosquitoes.

Final Thoughts

Mosquito control is a blossoming area for urban pest management companies. There can be huge rewards for companies that enter the business and do good, appropriate work. Remember that what is needed is an integrated mosquito management program using inspection, treatment and monitoring to assure quality control. Remember to educate your customers about mosquitoes so they limit or eliminate mosquito breeding areas in their yards and neighborhoods. **PP**

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



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WHERE: North side of Museum Road, across from Lake Alice on the UF campus, Gainesville, FL 32611

WHEN: Sunday, August 6, 2017

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The Main Event — Interactive Lab Tour

WHERE: Urban Entomology Laboratory, Steinmetz Hall, 1881 Natural Area Drive, UF Campus, Gainesville, FL 32611

WHEN: Monday, August 7, 2017

9:00 AM – 9:15 AM
Registration

9:15 AM – 11:00 AM

Ant Colony, Fly and Mosquito, Bedbug Feeding, and Cockroach Room Tours

11:00 AM – 12:00 PM

Honeybee and Termite Lab Tours

12:00 PM – 1:00 PM

Lunch with the Students

1:00 PM – 1:30 PM

Student Presentations

1:30 PM – 3:00 PM

Insect Identification

3:00 PM – 4:00 PM

Florida Museum of Natural History and Butterfly Garden Tour

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Friday, November 3, 2017



AGENDA

- 10:00 AM Arrive at Host Company
- 10:00 AM – 11:00 AM Meet & Greet/Tour of Host Company
- 11:00 AM – 12:00 PM Getting to know each other. Group discussions on your biggest challenges, noteworthy successes, and lessons learned.
- 12:00 PM – 1:00 PM Interactive Lunch
- 1:00 PM – 3:00 PM Getting down to the nitty-gritty; your chance to get your specific questions answered.



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How to Recognize and Develop Leadership Potential

HARVEY F. GOLDGLANTZ

HOW DO YOU recognize who, amongst your current employees, has the potential to develop into future leaders? While there are several core competencies to look for and measure, the two biggest indicators of potential leadership success are the ability to manage oneself and the capacity to understand and relate to those around you.

Do They Have 'The Right Stuff?'

Do your potential leaders try to find new approaches to getting work done? Do they understand the larger company goals and challenges? Are they eager to stretch beyond their current abilities? Do they understand other people's constraints and concerns? Do they recover well from setbacks or failures? Do they "live" and actively promote the Core Values of the Company? Do they appear to be aspirational and inspirational? Do they get "the big picture?" Do they say what they will do and do all that they say? Do they attract and retain quality staff? Have you seen sales and profits grow since they became managers? Have they taken the initiative to suggest new products, systems and procedures and helped you put them in place successfully? Have other staff members sought them out formally and informally for help, guidance, direction, support?

Six Leadership 'Qualifiers'

- ✓ **Good character.** Good character is necessary to be trusted on a team. Good character embodies integrity and honesty and a humble desire to improve.
- ✓ **Reliability.** Leadership is about trust, and trust is developed over time by doing what you said you would do.
- ✓ **People skills.** You can't lead people if you can't communicate with people. Leaders have to be able to engage with people and make them feel a part of things.
- ✓ **Teachable and open to suggestions.** A person who thinks they have all the answers will not succeed as a leader.
- ✓ **Passion.** If a person doesn't have that burning desire for success within themselves they will never be able to inspire others.
- ✓ **Confidence.** The ability to move forward in the face of diversity and the ability to "rally the troops" and build/inspire consensus.

Ultimate Goal: The Manager/Leader

Management and leadership skills are not mutually exclusive; they are complementary. Managers lead and leaders manage.

Managers do things right, while leaders do the right thing. Managers follow established rules while leaders challenge the status quo. Managers establish timetables to monitor and supervise, while leaders inspire others to lead themselves. Managers stress consistency and reliability, while leaders develop strategies to inspire a shared vision for the future.

The goal, for any progressive company, is to produce a team of "core driven" Manager/Leaders.

Three Critical Keys to Developing Manager/Leaders

Be a Mentor

Seek out opportunities to discuss goals, ideas and what they want to implement, or any struggles they're facing as they take on leadership roles. Your advice will provide valuable insight and encouragement.

Create an Ownership Mentality

You can coach people in leadership day after day — but they won't actually use those skills unless they feel like a trusted, valued and impactful part

of the company. Think about it: If you teach your employees how to make smart, informed decisions, but still require that they run every idea by you before they're allowed to make a move, how empowered will they feel?

Allow Them to Struggle a Little

It's important and beneficial to push them to figure out how to get what they need—on their own. Little by little, let your prospective manager/leader take on more responsibility. Eventually, they'll learn how to get what they need even without your help.

While some leadership qualities are innate, most leadership skills and experiences are nurtured in the workplace through leadership development. Determining who your emerging leaders are today can help turn them into your senior leaders of tomorrow. **PP**

Harvey F. Goldglantz is President of Pest Control Marketing Company, Inc., a consulting firm to the pest management industry located in Elkins Park, Pennsylvania. His clients range in size from start-up companies to those with revenues in excess of \$30 million. Goldglantz has been in the pest control industry for more than 40 years. He served three terms on the National Pest Management Association Board of Directors.

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What is Evidence-Based Turfgrass Management?

Erin Harlow

WHEN YOU VISIT a client's home or business and you are diagnosing problems in the turf area, what information do you use? How do you prove your information is correct if you think that there is an irrigation issue or lack of sunlight if the lawn is not responding the way you or your client expects? Hopefully you are using research-based information from the University of Florida and consulting with your local Extension agent. As a lawn and landscape professional you may know what the problem is, but having the tools to generate data that can be compared to research results is very important. We will discuss UF's movement toward providing more evidence-based approaches to turf management and training and how you can use that on-site to benefit your business.

The evidence-based approach means using the most current and best evidence when making decisions about the care of your turf. It is influenced by the expertise of the professional, the best research available, and the values and preferences of the client. This means that each site you manage may require different tools to conduct on-site measurements to reference to the sound research.

UF has two evidence-based programs that are focused on improving how you might use these techniques in your management programs. The first is the Evidence-Based Zoysiagrass Management Workshop. To date, the UF Turf Team has provided this program at five locations throughout the state to over 400 professionals. This workshop focuses specifically on zoysiagrass management and is in response to observations and challenges that professionals are experiencing



UF/IFAS evidence-based programs improve students' turf management techniques

in the field. The second program is the Evidence-Based Turf Management Short Course and is a program unlike anything that has previously been available.

UF Turf Schools

Inspired by UF's very popular palm schools, the UF/IFAS Evidence-Based Turf Management Short Course or Turf Schools are two-day programs that are broken into two parts. There is a short course focused on pest management and another on water, temperature, light and nutrition. Both events are designed to provide

in-depth, evidence-based education on turf management through lecture, field observation, and laboratory demonstrations.

While attending the UF turf schools may not be cheap, it is certainly professional development that is not available anywhere else, and they are well worth the investment. Both sessions were held at the Ft. Lauderdale Research and Education Center in 2016. Consider joining the UF turf specialists at the next turf school on September 6-7, 2017, in Gainesville, Florida. To register or for more information on turf school, please visit online¹.

Continued on Page 34

¹ <http://frec.ifas.ufl.edu/events/turf-school/>

Turfgrass Cultivar	Summer	Winter	Spring
Tifway hybrid bermudagrass	21.0	10.6	17.9
TifGrand hybrid bermudagrass	19.9	9.8	14.6
Celebration bermudagrass	19.6	8.8	14.9
TifBlair centipedegrass	13.4	9.5	14.1
Floratam St. Augustinegrass	11.8	8.5	11.6
Palisades zoysiagrass (japonica)	11.2	8.2	11.2
Captiva St. Augustinegrass	10.9	8.0	11.5
BA-417 (formerly Pristine-Flora) zoysiagrass (matrella)	10.8	7.3	10.6
JaMur zoysiagrass (japonica)	10.3	6.8	10.5

Table 1. Daily Light Integral Requirements (mol m⁻²d⁻¹). Dr. Bryan Unruh, UF/IFAS, 2015

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Predators

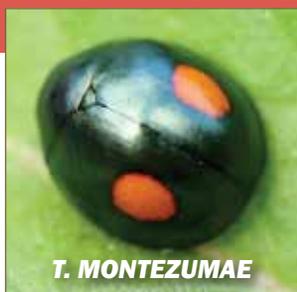
In the Landscape

Catharine Mannion

Associate Professor of Ornamental Plant Entomology at
University of Florida/IFAS
Tropical Research and Education Center

CHINESE MANTIS,
an introduced predator,
feeding on a cricket

Often, it seems we have many pest insects and mites in the landscape causing damage to our beautiful plants. The truth of the matter is that most insects and other arthropods in the yard and garden do not harm plants.



T. MONTEZUMAE

SEARCH ONLINE to find lists of plants used for the purpose of increasing the activity of natural enemies.

OF THE MANY insects and mites that are not pests, there is a subset considered beneficial species because they can affect pest populations. Called natural enemies, they can prevent, reduce or restrict the presence of pests. These natural enemies can be loosely categorized as predators or parasites. In this article we are discussing predators in the landscape.

UNDERSTANDING PREDATORS

Predatory insects and mites, as adults and/or at immature stages, actively search out and eat prey insects. There are numerous predators in the landscape that go unnoticed. In addition to existing natural enemies, there are often efforts to move or introduce new natural enemies into an environment.

In the landscape, successful introduction of a natural enemy can be very difficult. A lot of homework must be done before introducing a natural enemy and expecting success. However, protecting the natural enemies we already have can be done by everyone. This effort, called conservation, can be done by not using pesticides or only using select pesticides for pest management, and/or by modifying the environment to favor the presence of natural enemies. Conservation may involve increasing the diversity of plants as well as establishing sources of nectar and pollen for those natural enemies that need it. For example, syrphid fly larvae are great predators, but the adult flies need pollen or nectar on which to feed.

Generally speaking, predators find their prey by searching, so they are most effective when

the pest population is high. In South Florida, you can just about guarantee the presence of a **predatory beetle, *Ibalassa montezumae***, showing up when populations of croton scale get bad. A typical pattern is that there is a pest infestation. As the pest population increases, predators move in and bring the population down, which is then followed by a reduction in the predators unless the predators have alternate food sources.

These predators are often capable of keeping pest populations at a relatively low level so that damage is at a minimum. Their impact often goes unnoticed until something disrupts them, they are no longer there, and the pest populations increase.

There are also situations in which pest populations or the damage they cause become problematic even when there are predators feeding on them. For example, during the time period in which a pest population is building but before there is sufficient predator activity, there may be a need to apply other control strategies in order to minimize the pest presence or damage.

This is highly dependent on the pest and its impact as well as the environment. For instance, in a high-traffic area there may

be little or no tolerance of any pest problem. Rugose spiraling whitefly became a significant pest in the landscape in recent years primarily due to the enormous mess it makes with its waxy secretions, honeydew and subsequent sooty mold growth in the vicinity of an infestation. It is now under excellent biological control by *Encarsia formosa*, a tiny, parasitic wasp. But there are still occasions in which other pest control methods are used due to the shifts in both the pest and parasite populations and the level of tolerance for the mess that the whitefly makes.



E. FORMOSA

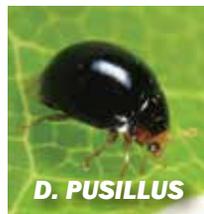
RECOGNIZING PREDATORS

The most common predators in the landscape include lady beetles, lacewings, predatory bugs, ants, and predatory mites. Lady beetles are probably the most recognizable insect predator. However, there are several lady beetle species that you may not recognize as lady beetles due to their color and size.

Most adult lady beetles are oval to round, brightly colored, and often have spots. Some well known species, such as the **Asian lady beetle** or convergent lady beetle are red or orange with many spots. However, some lady beetles can be very small and dark with no spots. For example, the whitefly predator *Delphastus pusillus*, is a shiny black beetle just 1/16 inch long. You might see these or similar beetles feeding on whitefly-infested plants. The immature stages of lady beetles can also be overlooked or misidentified. **Lady beetle larvae** are elongated and often dark with some color. In several species, such as *Thalassa montezumae*, the larvae can more resemble a mealybug than a beetle larva



ASIAN LADY BEETLE



D. PUSILLUS



LADY BEETLE LARVA



LADY BEETLE LARVAE

due to the white, waxy coating. Both the larvae and adult beetles can be quite voracious in the number of prey they will eat. There are several other groups of beetles that are predatory — ground beetles, rove beetles, and tiger beetles — of which most are not typically used in biological control. However, most of these beetles are generalist

feeders, and their impact in the environment can be very important. Efforts to conserve them are just as important as protecting many of the more commonly known predators.

Lacewings are another common predator in the landscape. Green lacewings are pale green with large, “lacy” wings but it is the larvae and eggs that are probably the most encountered stages on infested plants. The eggs are distinct because they are laid individually on a hairlike stalk often on the margins of leaves. You will often see a cluster of these eggs. The **larvae** look a little like small alligators with large, hooked mandibles — toothlike jaws that are used to catch



LACEWING LARVA

and feed on their prey. Unlike the ladybeetles, most of the impact is from the larvae feeding on prey. The adults primarily feed on nectar although they may consume a few insects. Somewhat related to the lacewings but very different are the mantids — i.e. praying mantis — much larger and obvious predators but not as commonly seen in the landscape.

Mantids are generalist predators that will feed on most anything of the right size.

Some of the **true bugs** (Hemiptera) are predators of insects and mites. These insects feed on their prey differently than the beetles. The beetles feed with toothlike feeding structures, and the bugs feed with a piercing-sucking mouthpart in which they pierce the prey and suck out the body fluids. Not all bugs are predatory. In fact, many of them are serious plant pests. For example, many of the stink bugs are important plant pests — green stink bug, brown stink bug, brown marmorated stink bug. The most common predatory bugs are probably the minute pirate bugs. These predators are often seen in flowers,

where they feed on thrips, spider mites and insect eggs. Another common predatory bug is the bigeyed bug, which is named so because of its relatively oversized eyes. These predators are often found feeding on moth eggs, caterpillars, thrips, and mites.

Flies are generally not wanted — they are pests and/or nuisances. However, the syrphid flies, which are also sometimes called flower flies or hover flies, are a valuable natural enemy because the larval stage preys on insects. The adult flies are harmless and often found feeding on flowers. The larvae can vary in color but resemble a small slug. These larvae will crawl over foliage and are quite voracious on small, soft-bodied insects.

Most of us do not think about the benefits of ants because they can bite or sting and can cause damage or be a nuisance. Some species also protect honeydew-producing insects such as aphids. But ants are important predators.

Ants have been shown to feed on many soft-bodied insects and have been credited for controlling pests in agricultural fields. Whether ants are a pest or a beneficial insect is highly dependent on where they are and what they are doing. With some exceptions, their presence in a landscape is a good thing.

Many mites are serious pests. But the phytoseiid mites are important because they are predators of plant-feeding mites and other small organisms. Many feed on the eggs and immature stages of thrips, whiteflies, and scale insects. Adults of some species feed on pollen, honeydew, fungi, and leaf sap. Adults typically have a translucent teardrop shape with long front legs. Several species of predatory mites are sold commercially and are probably one of the most commonly used natural enemies. Food and environmental requirements differ with different species of predatory mites. For example, *Amblyseius swirskii* is adapted to warmer and humid sub-tropical climates and can survive and reproduce on various pollens and plant nectars which may allow them to persist during periods of low pest density. Other mite species decline as their prey population declines.

RELEASING PREDATORS

Purchasing natural enemies for release can be a viable and successful option of pest management and has most often been used in greenhouse production systems and probably to a lesser extent field production. In the landscape, there are few examples of successfully releasing natural enemies for pest control but to a lesser extent compared to plant production systems. Usually,

an individual will not be able to buy and release a sufficient number of natural enemies into a landscape to have any real impact. However, there are situations in which mass releases of natural enemies have occurred through the efforts of universities or governmental institutions.

Prior to any release, big or small, it is absolutely critical to know the pest species and the environmental conditions

necessary for successful establishment of the natural enemy. Although many of the predators are classified as generalists (i.e. they eat many different types of prey), they may not all work well in all situations with all pests. For example, *Delphastus* sp. is a predatory beetle that is sold commercially as a “whitefly specialist.” It is an excellent predator of many different whiteflies. However, it does not do very well with the rugose spiraling whitefly, which produces excessive waxy flocculent. So in this case, this excellent whitefly predator may not be suitable for this particular whitefly. **PP**

Photo list with credits

1. Chinese mantis, Luc Viatour
 2. *T. montezumae*, Graham Montgomery, Bugguide
 3. *Encarsia formosa*, David Cappaert, Bugwood
 4. Asian multicolored lady beetle, Paul Choate
 5. *Delphastus pusillus*, Tom Murray, Bugguide
 6. Lady beetle larva, James Castner
 7. *T. montezumae* larvae, UF/IFAS
 8. A predatory bug feeding on a weevil, UF/IFAS
 9. Lacewing larva feeding on beetle larvae, UF/IFAS
- NOTE: This article appeared in July/August 2015 PestPro



CAPITOL Corner



Sean Brantley and Suzanne Graham

SESSION is over. What a session it was! The leadership exemplified exactly what not to do to make voters' voices heard. In what is the lowest number of bills passed in 20+ years, this legislature managed to barely eke out 249 bills out of 3,052 bills filed. This was no doubt a result of the house and senate leadership taking such extreme measures to control everything instead of being good stewards of the time-tested processes and procedures that help ensure Floridians are heard and needs are acted upon.

Most of the big issues did not pass this year, including worker's compensation changes, gaming issues, medical marijuana, and benefit assignment, along with others. Yes, that is right, Florida approved by majority vote of citizens constitutional amendments that our legislature should have acted on with priority and heart. Instead, they did nothing. Parties failed to prove their relevance by failing to stand up and be heard, and individuals struggled to gain traction on high-profile issues.

Even the budget was a problem for these elected leaders. Once again, they needed to move to extended session to pass the \$82.4 billion budget for 2017–2018. While they did pass

something, how they did it was another example of garbage. The budget was passed by attaching many conforming bills that require changes to statute in order to be part of the budget approval. This happened during the conference process and makes for a hot, sticky mess.

At this point, the governor's office has to weigh out the options of signing or vetoing and to what extent within his authority. There will be more playing out in the weeks ahead, and there is rumor that we might be reconvening a special session. I could go through pages of this review of session but will leave you to be the judge. By the time you read this, much will have been done to hopefully get us back on track.

THE CONSTITUTION Revision Commission meets every 20 years to review potential amendments to the state's constitution. The CRC has already begun its process by traveling around the state seeking public comment on all sorts of issues. A list of the proposals thus far is available online¹. The meetings will continue to travel around the state, and you should attend and be heard. Be sure to tell us if anything FPMA-related pops up.

THE FPMA has been busy working with DACS on several other issues, also. We have worked directly with NPMA, DACS, UF and the USEPA to conduct a special fumigation school at the UF School of Structural Fumigation site in Davie, Florida, in order to help representatives from every EPA division that has a hand on pest control-related items understand what we do and why we are so compliant by all measures. FPMA had representatives from GAC, BOD, Allied and Members present as instructors and point sources of information.

The school was a huge success, and we were able to provide a very important service to the USEPA as it continues to review fumigants during the Re-registration Eligibility Determination. I can tell you that we delivered high quality, concise and clear educational opportunities for everyone from the top down to the intern and from the lab to the label review. We made some new connections along the way and are continuing the conversations regularly.

FPMA has also been working with DACS on a number of clarification points, including some surrounding the Consumer Notification Form with pretreats and transfers. As we work through

these determinations we will let you know.

As far as the Consumer Notification Form goes, if your customer signs something involving wood-destroying organisms, you are going to need to get the Consumer Notification Form signed too. FPMA is also working on an outreach effort to help bring PCOs up to speed with training and walk-through demonstrations for the new fumigation-related rules. We plan to use regional meetings and webinars to help get the word out and, if needed, go right to the PCOs to educate them on how to get into compliance and remain there.

We are still in discussions about the Pest Control Identification Card and working with DACS on what the future of ID cards will look like. We are discussing ideas for future rulemaking and working as appointees to the Pest Control Enforcement Advisory Council.

Your Association is highly interactive with the Department, and our relationship is stronger than ever. Know that FPMA's GAC is busy, busy, busy and all for you! **FP**

Sean Brantley and Suzanne Graham are Co-Chairs, FPMA Government Affairs Committee

¹ <http://flcrc.gov/Proposals/Public>

Can a Condo or Similar Association Make Pesticide Applications to Their Own Property?

HOTEL/MOTEL maintenance staff or other employees of the hotel/motel can make pesticide applications to all areas of the company's property, including inside individual units, since there is no ownership associated with the renting of the units. An applicator should have the appropriate category of Limited Certification.

Condominiums can have maintenance staff or other employees of the association make pesticide applications to the common areas of the property, such as a building's hallway, lobby, elevator, utility room, laundry room, and to the exterior grounds. Condominium employees cannot make applications within an individual unit. An

applicator should have the appropriate category of Limited Certification.

Homeowner associations can have maintenance staff or other employees of the association make pesticide applications to the common areas owned by the association, such as entrance berms and right-of-way areas. Homeowner association employees cannot make applications to each individual property owner's lawn or structure. An applicator should have the appropriate category of Limited Certification.

In all of the above cases, any of the groups above could contract with a licensed pest control company to provide the pest control services on behalf of the entire community.

Also, the individual property or unit owner could make pesticide applications to their own individual residential property.

Property management firms, and/or janitorial or housekeeping firms and their employee(s) would not be allowed to make any pesticide applications to any property or properties they manage or service unless they are licensed with this agency as a pest control business.

Do commercial fertilizer applicators need to be licensed to apply fertilizers?

Any person making commercial fertilizer applications to an urban landscape must be certified by FDACS. To obtain a certificate, an applicant must take six hours of Green Industry Best Management Practices training and submit a copy of the training certificate and fee with the application form. A certificate is valid for a four-year period. Certification under this section does not authorize:

- The application of pesticide to turf or ornamentals, including pesticide fertilizer mixtures;
- The operation of a pest control business; or
- The application of pesticides or fertilizers by unlicensed or uncertified personnel under the supervision of the certified person.

Yard workers who apply fertilizer only to individual, residential properties using fertilizer and equipment provided by the residential property owner or resident are exempt from the requirements of this section. **PP**

Source: <http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Environmental-Services/Business-Services/Pest-Control/Pest-Control-FAQ>



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2017 Sustainable Business Award Goes to Safer Home Services

Tampa, FL — The Sustainable Business Foundation of Tampa Bay and the University of Tampa are proud to present Safer Home Services with the 2017 Sustainable Business Award. The Sustainable Business Award recognizes and honors for-profit businesses in Tampa Bay that engage in practices that increase economic opportunity, improve the environment, and support their communities.

Safer Home Services has been recognized for their contributions in building a sustainable economy in Tampa Bay, while embracing the “Triple Bottom Line,” being a company that strives to be a good citizen of the Tampa Bay community through programs to improve work environment, employee benefits, community infrastructure, and charitable outreach programs.

Over 80 Tampa Bay area businesses have been Award winners, including such leading employers as

Atelier Architecture, Doubletree Resort, Kenyon Energy, and Suncoast Credit Union. Safer Home Services is proud to join these companies as a recipient of this prestigious award. These businesses and Safer Home Services demonstrate practices that embrace social, economic and environmental responsibility.

A statement from Safer read, “Safer Home Services strives to be the best company to do business with and the best company to work for in the communities we serve. We look forward to continuing our pursuit of environmentally conscious pest control and expanding upon our current sustainable business practices.

“We would like to thank the Sustany Foundation for their recognition, and congratulate our fellow businesses in Tampa Bay that have also received this award.” **PP**

Report by The Sustany Foundation

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Evidence-Based Turfgrass Management, continued from Page 27

Incorporating Evidence-Based Turf Management into Your Program

Examples of evidence-based information that you might find helpful for you to incorporate into your sites includes light requirements for turf and using technology such as soil moisture sensors.

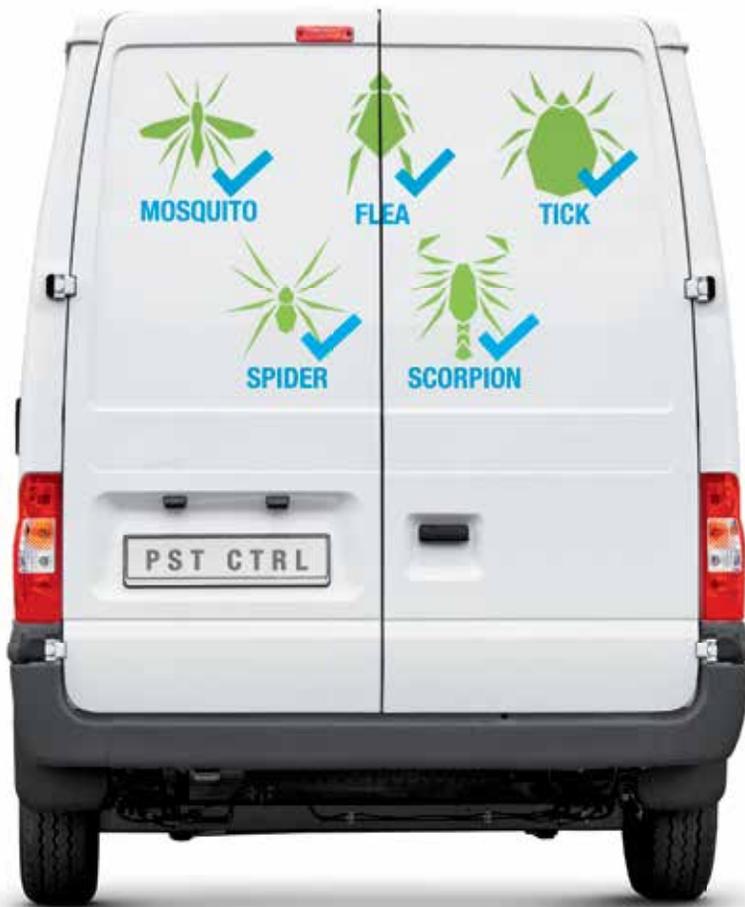
For example, the UF turf team has calculated the daily light requirement for different turf species, see Table 1 on page 27. Simple, inexpensive, light meters can be purchased that measure the amount of daily light integral (DLI) for a 24-hour period. In shady areas, the turf professional can place these meters throughout the landscape and be able to measure the light quantity.

In Table 1 on page 27 are the average daily light requirements for several turfgrass species. The higher the number, the more sunlight is required by the turfgrass cultivar. By comparing daily light integrals the turf professional has the evidence to support whether their turf is receiving enough light to have adequate growth. This would be an evidence-based approach versus telling your client that the turf needs a certain number of hours of sunlight and just guessing if it is actually receiving it.

It is also important to consider the quality of sunlight and the time of year. UF now has evidence of which wavelengths of light turf needs and which wavelengths trees absorb. If the trees absorb the wavelengths before the turf has access to them, then the turf is receiving a lower quality of light. You may also want to check the site at different times of the year. The light intensity may have changed and the sun will move. You can read more about daily light integrals and light quality online², or attend the water, temperature, light and nutrition edition of turf school. **PP**

Erin Harlow is Commercial Horticulture Agent for UF/IFAS Extension in Duval County.

² <http://wfrec.ifas.ufl.edu/turfgrass-science/resources/>



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