

SEPTEMBER/OCTOBER 2019

Rachel Carson, *Silent Spring*, and Pest Management

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Welcome Images



ON THE COVER

Green iguana. Iguana mating season is fast approaching, and populations will be booming. Now is a good time to learn how to safely deal with these exotic reptiles that roam South Florida.

Photo by Ariel Nunez Guzman, Pixabay



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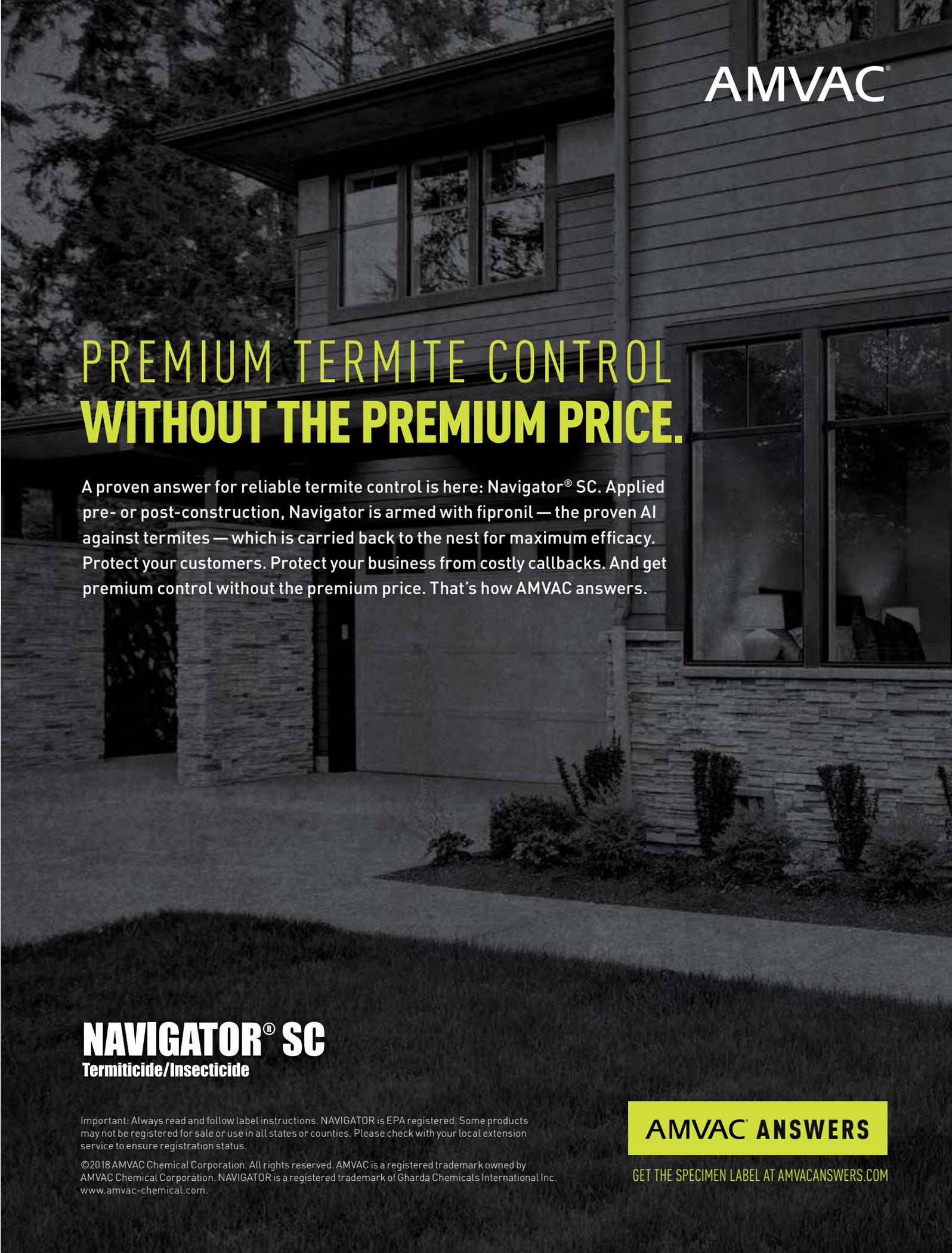
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Follow Us to FPMA's Fun Fall Events

Message from the President of FPMA

Eric Hoffer

SHALL I be so bold as to say FPMA has a new face? Well, that may be the impression you get once you see our newly updated website with all-new bells and whistles.

Most importantly, this website will help us serve our members better by providing them with an up-to-date interface that is much more user-friendly. Consumers will also be able to navigate the website with ease as they look for their local member company to service their home or business. If you have not had the chance to look at it yet, stop by and have a look around. We would love to hear what you think.

A lot has happened this year, and a lot is still to come. We just finished up our University of Florida Lab Tour, and we still have one of our best events — the Behind the Scenes Tour — coming up. Our Region 5 Shotgun Shoot is not far around the corner, either. Even during all this planning and movement going on in the association, we continue to work on bringing on new members and planning for next year.

Our most recent event, the Lab Tour that we do in conjunction with UF, had a great turnout and was rated highly by all who attended. This is the third year in a row we have done this event, and each year has been fantastic. The partnership between the University of Florida and FPMA is such an important one.

FPMA Events in AUTUMN And Beyond

AS SUMMER draws to a close, our efforts at FPMA for member engagement will continue in full force. We are looking forward to one of our newer but very popular events, the Behind the Scenes Tour. We have four great companies set up around the state ready to open up their way of doing business for everyone to discuss.

This event creates such a powerful environment to exchange ideas and best practices directly between people in the same industry. There is so much to gain from participating in this event. I have no doubt everyone will have something to share and something to learn. This event is at its core exactly what I think about when I speak this year's theme, *Knowledge through Networking*.

We are reaching out to nonmembers daily with much success. We continue to build our membership base, which in turn will help us make a difference in Tallahassee. The importance of all of us coming together under one umbrella to represent our industry in a knowledgeable and professional manner is extremely important to make sure our concerns are heard in the capital.

Even though it seems far away, we have already begun planning for the upcoming Expo in January. This event is our staple event, and we work hard almost all year long to make sure it will offer the most value to all who attend. This year is going to be one of our best yet. I look forward to seeing everyone around at the events and gaining more knowledge from networking while I do. **PP**

Eric Hoffer
President, FPMA



Visit our updated website at FLPMA.org !

Constant Change

In Pest Control

YEARS AGO, the pest control industry was founded on the simple concept of termite, rat, and cockroach control. Now pest control is much more diverse, and pest control operators are asked to control any nuisance animal, destructive pest, or disease vector.

Every day, the industry changes as new pests, diseases and control methods appear — and the old pests stay with us. All this requires contact training for technical directors and technicians so quality service is provided to all customers. For these reasons there has always been a close relationship between the pest control industry and scientists.

Many companies that bought into the pest management business did not understand these basic facts. There have been companies that provided cleaning solutions, trash pickup, lawn maintenance. Most of these companies had lots of cash and saw an opportunity to enter the pest management business. Over the years, most of these corporate ventures failed because their business plan did not recognize the value of keeping up to date on new pest developments, technical training, and scientific advancements.

One of the goals of *PestPro* magazine is to bring the Florida pest management industry closer to information that is critical for companies to survive constant change.

The Ever-Changing Pest Landscape

Let me give an example of industry change from this issue of *PestPro*: Iguanas.

Iguanas are now considered a pest species that should be controlled by professionals. What do you know about iguana control? Twenty years ago, iguanas were not considered a pest. Now they can be a lucrative business for the industry.

But iguana control walks a fine line. If you kill an iguana the wrong way, you could be cited for animal cruelty. If you shoot at an iguana and hit a pool maintenance worker, like what happened in Boca Raton, you may be liable for medical and other expenses. If your technician does not know how to capture and handle an iguana, you may have to pay workers comp for the mishandling.



Iguanas: The new face of pest control in Florida?

Last year, none of this was an issue. All that changed in July 2019 when the Florida Fish and Wildlife Conservation Commission declared that iguanas should be killed as introduced exotic pests.

Another example of industry change from several years ago was the introduction of baits for control of German and other cockroaches.

When I first heard of baits for cockroach control, I was very skeptical. My first statements were that baits just don't work for German cockroaches. That was based on past experience with chlorinated hydrocarbon, pyrethroid, and organophosphate baits.

Once we tested newer baits like hydramethylnon, fipronil and indoxacarb baits, I became a believer that baits were a great way, perhaps the best way, to control German cockroaches. It took 10 to 15 years to convince the industry with hard scientific evidence and company experience that cockroach baits worked well and were reliable. There was a slow, steady transition from kitchen cleanout operations in homes to a more rational management program.

A third example is IPM. I remember presenting the first urban IPM programs in Florida for the pest management industry when I was told nobody would attend. The concept was that people paid pest managers to apply pesticide on a schedule: maybe

weekly, monthly, quarterly or some other prescribed calendar basis. Many people were afraid of the effects of pesticides and wanted their use limited, but the industry was not ready to hear those ideas.

I started thinking that there were three concepts everyone could agree on. First, that pests should first be prevented so they don't occur as often in a customer's account. Second, that pesticides should NOT be applied if there is nothing there to kill. Third, that pesticides should be applied to locations where pests are located, NOT to areas where people and pets contact. Those three concepts are a basis for IPM and still are relevant for everyone.

Pest Industry Thrives with Change

It took a long time for the National Pest Control Association and the Florida Pest Control Association to change to the National Pest MANAGEMENT Association and the Florida Pest MANAGEMENT Association. That was a huge change for the industry.

All these changes require knowledge to be transferred from scientists to pest control businesses. Businesses that fight change are in danger of failing. That is what has happened to some in the past when certain companies or individuals did not respect education and value new ideas and concepts for their business.

At *PestPro*, we try to bring together scientists and their new findings with the industry. We send out more than 12,000 copies of the magazine to people who practice pest control in Florida. The fact that we use University of Florida scientists as authors and the information is new and current helps us provide information so all companies have the capability of succeeding with the most up-to-date information.

Attendance at educational meetings for the industry is at an all-time low. We hope that *PestPro* magazine fills the void and provides a continuing resource for companies to be able to change, grow and prosper. **PP**

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

ALIEN INVADERS!



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WEDNESDAY, September 25, 2019

- 7:00 AM — 8:30 AM Registration
- 8:30 AM — 9:25 AM **L&O** L&O Pest Management — Adam Dale ¹
- 9:25 AM — 9:40 AM Break
- 9:40 AM — 10:35 AM **L&O** Landscape Palm Diseases — Stephen Brown ²
- 10:35 AM — 10:50 AM Break
- 10:50 AM — 11:45 AM **WDO** Formosan Termites — Ben Hottel ³
- 12:00 PM — 1:15 PM Lunch — Bayer Pizza Party
- 1:15 PM — 2:10 PM **WDO** Termite Basics — Phil Koehler ¹
- 2:10 PM — 2:25 PM Break
- 2:25 PM — 3:20 PM **GHP** Bed Bugs — Roberto Pereira ¹
- 3:20 PM — 3:35 PM Break
- 3:35 PM — 4:30 PM **GHP** Mosquito and Fly Control — Phil Koehler ¹

Field Day for Technicians / CORE

- 8:30 AM — 9:25 AM **CORE** Integrated Pest Management in Urban Settings — Rebecca Baldwin ¹
- 9:20 AM — 9:40 AM Break
- 9:40 AM — 10:35 AM **CORE** News and Tips from FDACS — Paul Mitola ⁵

¹UF/IFAS Entomology and Nematology

²Lee County Extension

³FL A&M University—Center for Biological Control

⁴UF/IFAS Ft Lauderdale Research and Education Center

⁵FDACS

REGISTRATION

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Juvenile green iguana

Luis Ovalles

Dealing with Iguanas

In the South Florida Landscape

William H. Kern, Jr.



Adult female green iguana is about 4 feet long

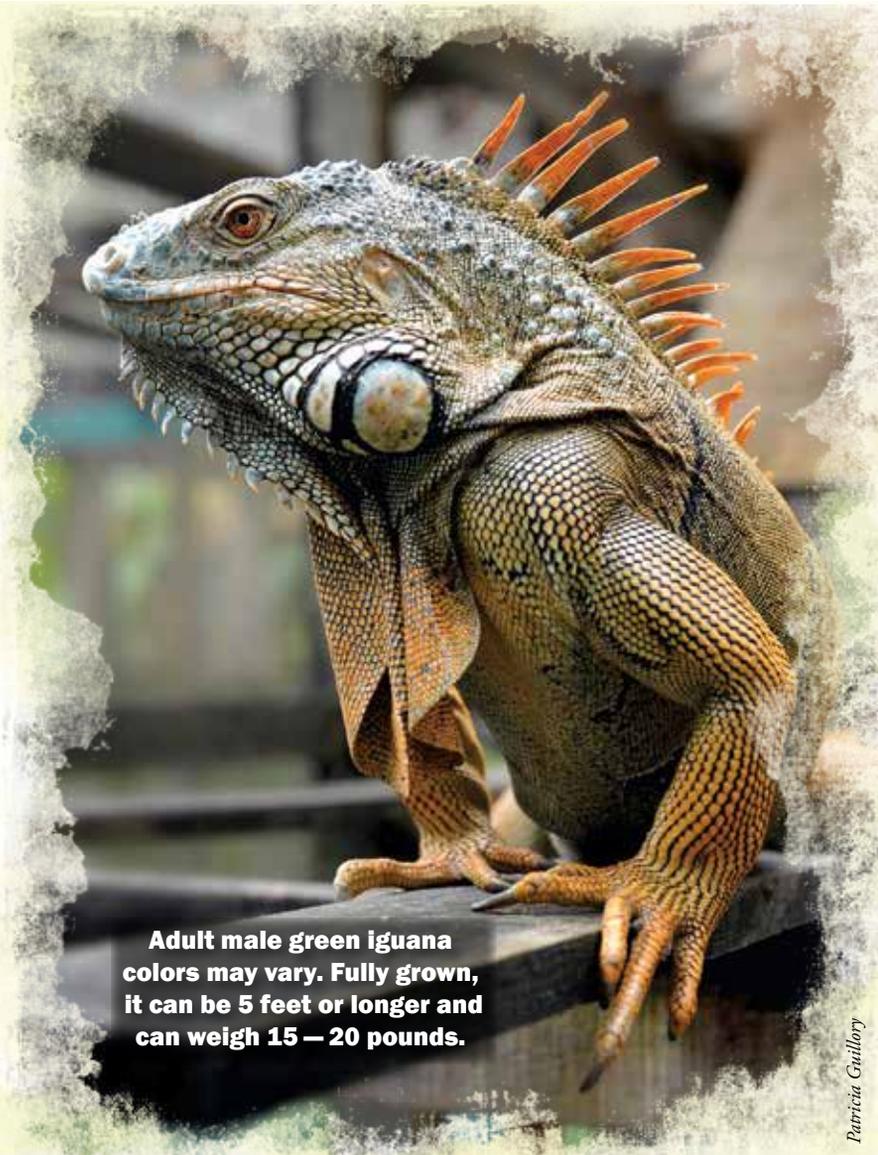
Coyambe

DUE TO Florida's prominence in the exotic pet trade, iguanas imported as pets have escaped or been released and are now established in South Florida. This has created unique problems for Florida homeowners and businesses.

South and Central Florida's subtropical climate allows these large, plant-eating lizards to survive, reproduce and become part of the Florida environment.

Three large members of the iguana family, Iguanidae, have become established in South Florida. These are the common green iguana, *Iguana iguana*, the Mexican spiny-tailed iguana, *Ctenosaura pectinata*, and the black spiny-tailed iguana, *C. similis*.

Large male spiny-tailed iguanas are often misidentified as alligators by startled homeowners because of their reduced dorsal spines and dark color. Males reach 3 to 4 feet in length as adults. *Continued on Page 11*



Adult male green iguana colors may vary. Fully grown, it can be 5 feet or longer and can weigh 15 – 20 pounds.

Patricia Gullory



Mexican spiny-tailed iguana adult male is 3 – 4 feet long

Dick Gilbert



Mexican spiny-tailed iguana adult female is about 3 feet long

University of California, Berkeley



Black spiny-tailed iguana adult male, center, and females

Christian Muhlhuber

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Habits

Adult iguanas are herbivores, feeding on foliage, flowers and fruit. They occasionally eat small animals such as insects, lizards, and nestling birds and eggs. Juvenile iguanas eat more animal material, especially insects. Hatchling green iguanas eat the droppings of adult iguanas to acquire the gut bacteria that help them digest plant material.

Male iguanas are territorial against other males, but are not territorial against females and juveniles. These large lizards like to bask in open areas, sidewalks, docks, seawalls, landscape timbers, or open mowed areas. If frightened, green iguanas dive into water, which makes them difficult to capture. Spiny tailed iguanas retreat into their burrows.

Damage

Damage caused by iguanas includes eating valuable landscape plants, shrubs and trees, eating orchids and many other flowers, and eating dooryard fruit like berries, figs, mangoes, tomatoes, bananas and lychees. Iguanas do not eat citrus.

Burrows that they dig undermine sidewalks, seawalls and foundations. Iguana burrows next to seawalls allow erosion and eventual collapse of those seawalls. Droppings of iguanas litter areas where they bask. This is unsightly, causes odor complaints, and is a possible source of salmonella bacteria, a common cause of food poisoning.

Adult iguanas are large, powerful animals that can bite, cause severe scratches with their extremely sharp claws, and deliver a painful slap with their powerful tail. Iguanas normally avoid people but will defend themselves against pets and people that try to catch them or corner them.

Control Options

Do not feed iguanas in the yard. This will attract more iguanas and can create problems for both you and your neighbors. Pans of cut fruit will also attract rats and raccoons. Remove any fruit dropped from trees.



Black spiny-tailed iguana young male

Tony Higgett

EXCLUSION

Protect valuable plants with cages or screen enclosures. There are repellents registered to prevent feeding damage from iguanas. Install sheet metal around trees about 18 inches from the tree base to prevent iguanas from climbing, or create an L-shaped wire barrier to prevent iguanas from digging.

HABITAT MODIFICATION

Avoid planting species that are preferred food for iguanas — see table at lower right.

Remove protective cover such as dense thickets and piles of landscape timbers or rocks. Sheet metal guards of trees, palms and dock pilings will prevent iguanas from climbing. Fill vacant burrows with concrete and sand during the day when the animals are likely to be away from the burrow.

Electric fences on seawalls and docks may deter or stop iguanas from climbing up onto them. Persistent harassment will also encourage iguanas to move to safer pastures.

HARASSMENT and INTERFERENCE WITH REPRODUCTION

Spraying with a water hose, and loud, startling noises are effective in creating an unwelcome atmosphere for basking iguanas. Install shiny CD discs near sea walls, or dangle CDs on trees or other prize plants. Change position of the CDs often enough so iguanas do not become accustomed to their light reflections.

Build mulch piles or sand piles near sea walls to encourage iguanas to nest in them rather than digging nesting burrows that undermine the sea wall. Open the nest, remove the eggs, and dispose of them in a sealed plastic bag.

NATURAL ENEMIES and HAZARDS

Raccoons, fish, crows, vultures, feral pigs, and other predators dig up iguana nests and eat the eggs. Raccoons, snakes, hawks, owls, egrets, herons, cats and dogs kill the majority of hatchling and juvenile iguanas. After young iguanas reach about two feet in length, they have fewer natural enemies.

Chain link fences are another common hazard to larger iguanas. If they get their head and front legs through the openings in the fence but can't squeeze their belly through, they are stuck, unable to back out of the fence.



Brian Gratwicke

Iguana skull, showing upper and lower teeth. The teeth of a green iguana are designed to shear plant material, but can deliver a painful bite to people and pets.

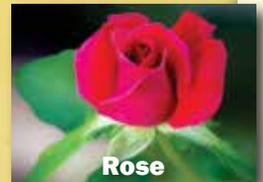


UF/IFAS

The nesting burrow of a green iguana.

Preferred iguana food plants

- Hibiscus, including roselle
- Orchids
- Impatiens
- Pink pentas
- Roses
- Bougainvilleas
- Nasturtiums
- Garden greens: Kale, broccoli, mustard, collards, sorrel, beets, and lettuces
- Squashes and melons
- Hong Kong orchid tree
- Purple queen, *Setcreasea* sp.
- Turf grasses
- Weeds, including Spanish needles and frog fruit
- Most fruits and flowers
- Most tender, new growth



Rose

Iguana-resistant plants

- Milkweed
- Some pentas
- Oleanders
- Citrus
- Some crotons
- Other toxic plants
- Tough, thick-leaved plants



Oleander

Continued on Page 16

Cultural Practices:



The foundation of effective pest management

Adam Dale

WHO wants their beautiful lawn or lush landscape eaten up by insect pests? Thoughtful cultural practices can keep pests at bay and encourage natural enemies of the pests. The resulting healthy, stress-free plants thrive, with less need to take further pest management measures.

MOST pest control professionals know that cultural practices are critical to effective integrated pest management programs. If you have not learned that, you are either new to the business or your eyes were shut before that slide came up in one of my presentations.

Either way, it won't be long before you get frustrated with an irrigation schedule, plant selection, mowing height, landscape design, or planting depth, to mention a few cultural considerations. In many cases, these factors set a landscape up for either success or a chronic struggle.

Plant stress is a catalyst for pest problems

Since the very first person planted an ornamental landscape or lawn, people have recognized that some planting decisions or maintenance practices do not turn out well. Many of the

insect pests that outbreak and damage our lawns, trees and shrubs are responding to local environmental conditions and the stress level of their host plants.

The conditions that affect these factors range from the soil to the plant species and the surrounding ground cover, as well as the amount of water and sunlight they receive. For example, planting a tree surrounded by too much hardscape can increase drought stress and insect pest problems¹. Mowing a St. Augustinegrass lawn to look like a golf course green will stress the grass and lead to a multitude of problems, costing a lot of time and money².

Cultural practices can be optimized to improve plant health and reduce pests. My lab's primary goal at UF/IFAS is to develop new cultural strategies that help alleviate some of the many insect and mite pest challenges we face in turf and ornamental systems.



Thatch management

Just beneath the foliage of a turfgrass lawn and above the soil surface is a thin layer of dead, decaying plant material called the thatch. This naturally occurring material provides benefits including releasing nutrients back into the soil and to the plant roots.

However, when a turfgrass lawn is managed incorrectly — e.g., too much nitrogen — too much thatch can accumulate and lead to pest management challenges. For example, too much thatch will bind pesticides that are applied to a lawn, reducing the amount of product that reaches the soil or its intended target. Thatch also provides a nice refuge for pests.

Over the past few years, pest management professionals throughout much of Florida have battled an insect in zoysiagrass called the Tuttle mealybug³. After dozens of outbreaks and failed control attempts, we have realized that a common denominator among lawns infested with Tuttle mealybug is an overaccumulation of thatch.

When we dethatch a zoysiagrass lawn and then apply an insecticide, our success rate is much higher. When we dethatch a zoysiagrass lawn *before* there is a mealybug infestation, the likelihood of seeing a Tuttle mealybug infestation is much lower. Again, in many cases, cultural practices determine if this pest becomes a problem.

Proper irrigation

Water is the building block for life. In many cases, too much or too little water can lead to a series of insect plant pest problems. For example, when St. Augustinegrass becomes drought-stressed, the likelihood of damage from southern chinch bugs significantly increases⁴.

Similarly, when red maple trees are planted in sites where they become too hot and

drought stressed, their scale insect parasites produce more offspring and become more abundant, which cumulatively reduces tree condition⁵.

In contrast, some insects thrive in wet soils. For example, white grubs and invasive mole crickets like the southern and tawny mole cricket are more likely to infest and damage turfgrass areas that receive too much water. Turn on a bright light at night adjacent to this wet soil and you have an even bigger infestation⁶.

As illustrated by these examples, proper irrigation practices, plant selection, and landscape design are essential to maintain the water balance required for healthy plants. The solution to these problems is not always how much or little you are irrigating. Rather, the solution may be proper plant selection based on the site conditions.

Plant selection

A phrase commonly heard by landscape management professionals is, “right plant, right place.” When you have a planting site in full sun or well drained sandy soils, select a plant that can handle those conditions without additional inputs.

In addition to matching a plant species to the local conditions of the planting site, this phrase means selecting plants that may be less susceptible to common pests. Differences in pest susceptibility can occur even within a single plant genus.

My lab is comparing the susceptibility of the most commonly used holly, *Ilex* spp., and camellia, *Camellia* spp., to tea scale, one of the most common insect pests of these plants. *Continued*

¹ <http://edis.ifas.ufl.edu/in1185>

² <https://edis.ifas.ufl.edu/lh028>

³ <https://edis.ifas.ufl.edu/in1166>

⁴ <https://edis.ifas.ufl.edu/lh036>

⁵ <http://edis.ifas.ufl.edu/in1185>

⁶ <https://edis.ifas.ufl.edu/in1021>



Dethatching the lawn may prevent mealybug problems



Tuttle mealybug on a zoysiagrass leaf, closeup



Chinch bugs thrive in hot, dry conditions

Mole crickets thrive in warm, soggy conditions



Camellia



Yaupon holly, *Ilex vomitoria*



Three holly species: *Ilex cornuta*, *I. opaca*, and *I. vomitoria*

Matthew Borden, UF/IFAS



Holly infested with tea scale, *Fiorinia theae*.

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Some of our earliest findings suggest that yaupon holly, *I. vomitoria*, becomes significantly less infested and damaged by tea scale when compared to American holly, *I. opaca*, and Chinese holly, *I. cornuta*. With the improved drought tolerance that yaupon hollies provide, reduced susceptibility to tea scale may make this plant right for several places — not to mention you can make tea with their leaves (stay tuned for a future article).

IPM is a multi-pronged approach

Although proper cultural practices are essential to successful IPM programs, in many cases we do not yet know what cultural practices are best. Also, several invasive pests require more than cultural pest management.

Therefore, other pest control tactics like biological and chemical control are also vitally important⁷. For example, installing various flowering plants in a landscape will attract beneficial insects that help control plant pests — see the September/October 2018 issue of *PestPro* magazine.

When making insecticide selections, consider that product's spectrum of activity and whether it is compatible with the beneficial organisms that are also providing pest control. In the most successful pest management programs, pest populations are being controlled culturally and biologically — and chemically when needed. **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 <https://dalelab.org>.

⁷ <https://edis.ifas.ufl.edu/in109>

Hometown: Bethel, Connecticut. Moved to Florida after high school.

Where you live now: Sarasota

About your company: Fahey Pest & Lawn Solutions was established in 1943 by Thomas A. Fahey. My father, David Pomfret Sr., bought the company from Tom in the mid-1960s and ran the company until his retirement in 1993. I then bought the company from him, and my wife, Terry, joined me in the business after working 20 years at Florida Power & Light.

Today our son Kyle is general manager for the company and is running the day-to-day operations. His wife, Hilary, has joined him in the business running the front office. We employ 42 team members servicing Manatee, Sarasota and Charlotte counties.



David Pomfret

First paying job and what you learned from it:

My first job was washing pots and pans for about three hours after school five days a week at a high-end restaurant in Danbury, Conn. I did that for about six months. Walking in each day to find piles of dirty pots and pans to be cleaned before opening for dinner, not only did I learn not to be afraid to get my hands dirty, but learned about perseverance and commitment to getting the job done and doing it well.

First break in the pest business:

My parents were divorced, and I would spend summers in Florida visiting my father, so I kind of grew up in the pest control business. During the summer visits I did a little work each year, starting at the age of eight. My first job was to fill throw packs with rodent bait pellets. Each year as I grew I would learn about lawn service, termite control, pest control, rodent exclusion, and fumigation.

Best piece of business advice you received:

Approach business with an attitude to treat your customers as you would want to be treated: with respect, honesty and by always doing the right thing, even if you sometimes disagree. You will sleep well at night and always have a great business.

What you would tell someone new to the pest business?

Set small goals at first and be patient. It's the learning experiences of each day that will give you more and more confidence. Treat your customers and employees as you would want to be treated.

Where can we find you when you are not at the office?

I'm finally finding more time to play golf! My wife and I also enjoy boating, motorcycling, skiing, and traveling in our motor home seeing the country.

What is the most important trait you look for when hiring?

I look for a person that has a positive and eager attitude. That trait generally translates into a customer-friendly, customer-first team member. **PP**



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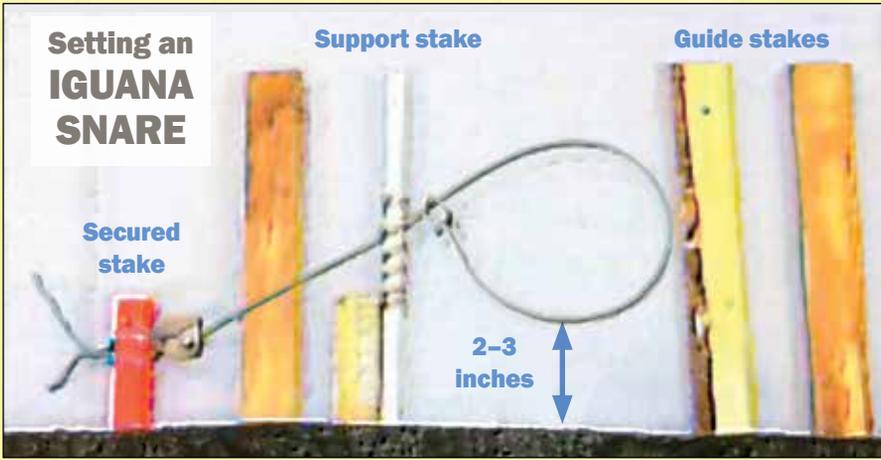


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Iguanias, continued from Page 11

CAPTURE AND REMOVAL

Iguanias can be captured and removed from private property at any time without special permits. They are considered exotic, unprotected wildlife. They may be caught by hand, noose pole, net or traps. Only live traps and snares are legal in the state of Florida. Check with local authorities for any local ordinances that may limit control options.

Do not use poisons or steel traps (leg-hold or body-gripping types) to capture or control nuisance iguanias. No poisons are registered or legal for use on iguanias or any reptiles in Florida. Baby iguanias can be caught by hand or with a thread or monofilament noose on a long bamboo pole.

It is illegal to release iguanias in Florida as stated in 39-4.005 Florida Administrative Code. Iguanias are not native to Florida and so are not protected in Florida, except by anticruelty laws. Green iguanias are listed in the *Convention on International Trade in Endangered Species II* because of their economic importance and overharvest for the international pet trade in their native range.

In Florida, all captured iguanias must be kept in captivity as pets or captive breeding stock, or must be destroyed. Feral adult iguanias rarely make acceptable pets. They never tame sufficiently and are dangerous. Remember, they can deliver severe bites and scratches, and strike with their muscular tails.

Trapping, either with live traps or snares, should be considered a last resort. Traditional live animal traps baited with grapes, pieces of ripe melon, papaya, or mango can be very effective, especially if the traps are prebaited for some time prior to setting the trap. Prebaiting simply means securing the door open and placing food in the trap so the animals get used to entering the trap



for food. Once they are regularly entering the trap, release the door and set the trap normally.

Florida law requires that animal traps be checked at least once every 24 hours. When trapping iguanas or any animal, check the trap as often as possible. Iguanas will often get cuts and abrasions when trying to escape from traps. Covering the trap with a burlap bag or old blanket when setting it may reduce this behavior by making the animal feel less exposed or vulnerable. There are many other types of live traps that may catch iguanas, including funnel entrance traps.

Iguanas and many lizards hold their heads up as they walk or run, to better watch for predators. This behavior makes them ideal candidates for snares. The 24-inch locking snares normally sold for trapping muskrats, minks or rabbits are large enough for any iguana. Set snares at burrow entrances, holes under fences, along seawalls, or any place that iguanas regularly congregate or move. The photo at far left shows how to set a snare.

Snares can kill by strangulation if they are set to do so or the animal struggles too long. Snares cannot discriminate, and can kill pets or wildlife if not carefully set and monitored. Snares set for iguanas should be set only during the day because that is when iguanas are active, while cats, raccoons and opossums are generally nocturnal.

During winter cold fronts, cold-stunned iguanas can sometimes be simply picked from branches or picked off the ground after they fall from the trees. Using boats along canals and in mangroves when the temperatures are 40° to 50°F has been very successful. This is a very effective method to reduce local iguana populations.

Continued on Page 32

PEST DETECTIVE



Small hive beetle larva



Larva on carpet



Adult

3 mm

Photos by Lyle J. Buss at high magnification

Small Hive Beetle

Lyle J. Buss

ONE MORNING I got a call from a young lady. She sounded tired and stressed and told me how she had spent the entire night sweeping up insect larvae in her apartment. A plague of these larvae kept crawling out from under her baseboards.

The larvae turned out to be small hive beetle larvae. If you're familiar with small hive beetles, you know they are pests of honey bee hives. And from that, you can probably guess that their presence in a home indicates that there is a honey bee nest in a wall or attic space.

Sometimes homeowners already know about the bees and have seen bees flying in the home or have heard activity in the walls. But they often don't realize that there is an association between the bees and the beetle larvae.

When small hive beetles are seen in a home, it is almost always the larval stage that is observed as they are crawling away from the bee nest to pupate. The larvae are whitish and about $\frac{3}{8}$ " long. They have two pairs of large spines at the tip of the abdomen, and two rows of spines down their back. The adults are dark brown, somewhat flattened, and nearly $\frac{1}{4}$ " long.

The best way to get rid of small hive beetles in a home is to get rid of the honey bee nest. Removing the nest can be quite a job, especially if a wall needs to be opened up to get to the nest. If you can get an insecticide into the void, you can kill the bees and the beetles.

But leaving the nest in the wall can lead to other problems. Honey may leak out of the combs, causing a mess. Or dermestid beetles may eventually get in to feed on the dead insects or bee nest material. A couple of my clients have collected another bee hive pest, the lesser wax moth, flying in their homes, in addition to the small hive beetle larvae. **PP**

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

Luke Prescott

reporting



Termites and their trails are Luke's research subjects at the UF Urban Entomology Lab.

The oldest of three brothers, Luke Prescott has always been into playing sports. He loves to lend a helping hand to others. And, as it turns out, entomology seems to run in his family.

LUKE is a first-year master of science student under the direction of Dr. Phil Koehler at the University of Florida. He attended UF for his undergraduate degree, obtaining his bachelor of science in entomology and nematology.

A South Florida native, Luke comes from a line of pest control operators

starting with his grandfather, Carl Prescott, who worked for Orkin for many years until he decided to start his own company, Boca Sunstate Pest Control, in Boca Raton. Luke's father, Chuck Prescott, took over the company after working for Carl for a number of years.

Being in a family where entomology and pest management were always around him, Luke found a fondness for science and the scientific method very early. He recalls the early days as a kid being picked up from elementary school in his dad's work pickup truck and hanging out at the work office for a while, curiously examining all of the insect posters on the walls.

Even with so much entomology around him, Luke didn't have entomology on his mind when he started college.

How did you get into entomology?

Funny enough, entomology has always been around my life, pest control in particular. My father owns a small pest control company in my hometown of Boca Raton, Florida. I worked for the company as I grew up so, with that said, insects have always been in my life.

Did you consider any career paths other than entomology?

I never set on going to college for entomology, since my original plan was to do pre-med studies. From the time I was a little kid, I recall wanting to be a doctor. But obviously, as you grow up, reality becomes a little more different than your childhood dreams.

That's a big change. How did it come about?

Through a number of events I eventually changed majors from biology to entomology after meeting advisor Rebecca Baldwin and professor Phil Koehler after my second year of undergraduate school.

Tell us a little about that whole decision-making process.

It was not an easy call for me to make, and honestly one of the toughest decisions I have made. For so long I told myself I was this one person, when I was quickly becoming someone else. However, with my history and knowledge of the profession of pest management, it seemed like the right new road for me.

Since the switch, I have made some great friendships, taken part in some incredible academic and networking

for DUTY

opportunities, and I have graduated with a B.S. degree in entomology and nematology. I am now pursuing my M.S. degree under Dr. Koehler, funded by the U.S. Navy Health Services Collegiate Program. Even with all the ups and downs that came with this path, I wouldn't take back any of it.

You mentioned the Navy, how did you become involved with that?

So, this started back when I met with Dr. Koehler and agreed to come on the team of undergraduates in his lab. We discussed possible future jobs in entomology and the military avenue came up. Immediately, I felt drawn to that job prospect.

Haven't other urban entomology students found careers in the Navy?

Interestingly enough, a number of students have come through Dr. Koehler's lab and joined the Navy after getting their M.S. degrees. This gave me inspiration, and I further conveyed interest in this program to Dr. Koehler. At that time, a master's student was in this program, Randy Buckley, who was able to give me a ton of info on the military and help guide me through the process.

How will your academic and Navy careers combine?

I eventually got connected to my recruiter and after a year of the process through senior year, I got accepted by the Navy into their Health Services Collegiate Program (HSCP). I enlisted in the Navy back in July and I



Luke Prescott balances his academic career and naval career, shown outside the UF Urban Lab.

will be commissioned once I complete my degree. I will then serve as a medical entomology officer in the Navy.

What interests you in the military?

To begin, I simply love my country and I have always wanted to join the service in the right capacity. It just seemed like the right thing to do. I have had history of family members serving in the armed forces, and I always have been inspired by them.

Why did you take the Navy entomology route?

I chose the entomology route mainly since the opportunity was brought to me by Dr. Koehler, but my interests go way beyond that. I have always been interested in global public health and disease epidemiology.

Well, some of the largest health concerns regarding those topics are heavily entomology related. Diseases like malaria and

dengue fever are vectored by mosquitoes. The military does a good amount of public health work in these sectors, so I just saw it as a meshing of large interests and goals of my life.

So, what are you specifically studying for your master of science degree?

I will be under Dr. Koehler studying entomology in his lab. More specifically, I am looking at termite trailing and a solvent that can mimic termite-trailing pheromones and the possible implications of that.

It sounds like you will end up helping others through your entomology studies.

I am quite excited about how the research could possibly benefit the urban entomology industry in regard to termite control, especially coming from a region where termite problems are constantly ongoing.

It may not sound like a medically relevant topic, given my future career in the Navy, but I feel like it is very important to pest management and a homage to what drew me to entomology in the first place. **PP**



Luke at a 5K run with UF Urban Lab associates

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Social Media and Your Pest Control Business: Doing What's Right for You

Alain Parcan



WHILE someone may have spent hundreds of dollars on pesticides and traps, that doesn't make them a pest management professional.

The same can be said for businesses on a larger scale. Having premium tools means nothing if you aren't using the tools effectively. This is often the case with how pest control companies choose to use their social media.

Social media is an indispensable marketing tool that happens to touch on most aspects of our daily lives. Some people wake up and make social media the first thing they look at. Others use social media to find local pest management businesses around them that can provide them with a quote or service.

In order to stand out, you can't just create a couple of pages and hope for the best — you have to craft a social media strategy that works for your business.

Reviewing the Basics

First off, we'll do a quick crash course on some social media basics.

Facebook is one of the most popular social media sites and is used by the widest audience. It makes sense for pest businesses to use this platform, as they'll have access to the largest amount of users. Facebook gives prospective customers a chance to learn more about your company, ask you questions directly, and share their experiences in the form of public reviews.

Twitter is another popular platform and is a great place to share announcements, tips, photos and quick videos. Users can interact with you by responding to tweets or sending direct messages, but they can't leave reviews for others to see.

Instagram continues to be one of the fastest growing platforms, bringing in more and more users at a high rate. Instagram is a visual platform where you can share photos and videos. In recent times, Instagram has become more business friendly, allowing users to advertise products and share promotions with customers. This platform is great if you're looking to reach a younger audience.

Social Media Planning

In order to make the most out of your social media presence, it's important to answer a few questions first.

"What is the function of my social media?"

A pest control company won't be using Facebook the same way a pet care facility will. This is why it's important to never take a one-size-fits-all approach to social media. A pest control company will likely use Facebook to field service requests in messages and respond to reviews from customers. A pet care business will probably use Facebook to keep customers engaged with photos of the staff and even cute pictures of animal guests. Both strategies are valid in their own way, as they

demonstrate a knowledge of each business's audience and needs.

Answering the above question will guide you to the next one.

"What will my audience want to see?"

Another way to make sure you use your social media effectively is by considering your audience. Put yourself in their shoes and think about what they would want to see. Pest control companies often choose to share seasonal promotions and deals, which can drive calls and visitors to your website. They can also share informational articles about bug bites, how to prevent pests from entering your home, and weather announcements that may predict a certain swarm of pests.

The answer to this question may help you filter out social media pages that you likely don't need to spend as much time on. Your pest management company probably doesn't need to maintain an Instagram page if you don't expect your audience to tune into photos of your technicians' work.

An exception is if you focus on sharing photos around the office, your technicians' trucks, or other media that helps customers get to know your company on a more personal level. It's best to place your focus on a select amount of profiles that make sense to you, rather than opening up as many profiles as possible and hoping for the best.

"What is my end goal with social media?"

Some people use social to find new customers, while others use it to retain them. Think about what it is you really want, and whether or not a Facebook or Twitter page will do that for you.

Spending company time on social media is a more worthy cause when you have set goals and expectations to track. These goals will also help to shape what you're posting and how you present your company online.

SOCIAL MEDIA is infamous for taking up way too much of people's time. Don't let the same be said of your business. Make sure you're spending quality time on your company's social media presence and carefully considering its potential. Done right, social media can get you new, high-quality clients that will stick around.

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.

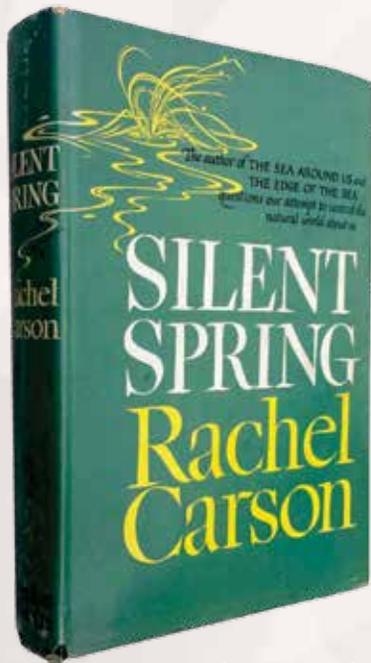
RACHEL CARSON,

Amos Willamovski



Rachel Carson

*In 1962, American zoologist and marine biologist Rachel Carson published her seminal book, **Silent Spring**. This work warned us about the indiscriminate use of insecticides to control pests.*



Silent Spring heralded environmental concerns that last to this day.



An old DDT powder box

THE INSECTICIDE that was particularly disturbing to Rachel Carson and many other researchers, medical professionals, and members of the public was DDT — the initial formulation of the group of chlorinated hydrocarbons, which were developed and first marketed in 1939.

DDT was widely used for many years to address the harmful epidemics transferred to man by insects, in particular the parasite causing malaria. DDT also contributed to an increase of around 50 percent in harvests, which ameliorated the problem of hunger in some parts of the world.

Like DDT, other formulations of chlorinated hydrocarbons were very stable in nature, in both soil and water as well as in the fatty tissues of animals, and resulted in serious contamination of the

environment. DDT was very unfriendly to the environment.

Other insecticides from the chlorinated hydrocarbon group were also extremely toxic to birds and mammals. In most countries, by the beginning of the 1960s most of these formulations were no longer authorized for use.

In the early 1940s, organophosphate formulations were first synthesized in Nazi Germany. These formulations are extremely toxic to humans, mammals and birds, but their residuality in nature is relatively short.

The formulation of carbamates was developed in the 1970s. They have an intermediate toxicity, and they break down over a relatively short period of time.

During the 1980s, pyrethroids were developed and marketed and are still widely used today. The toxicity of pyrethroid insecticides is very low to humans and warm-blooded animals, but their toxicity to insects is relatively high. Pyrethroids break down quickly after spraying outdoors.



Steven Martin

Silent Spring, and Changing Pest Management

A DDT ad,
circa 1947



Silent Spring Sparked Attitude Changes

Since the commencement of organochemical usage, there have been many far-reaching changes in the public attitude in relation to pest control. This trend must be attributed, among other things, to Rachel Carson.

Her book *Silent Spring* attracted the attention of the world to the potential dangers of chemical pest control. It also initiated a public struggle to protect the environment, which intensified and reached a peak in recent years.

Resistant Pests Made Some Pesticides Obsolete

The change in the trend in the use of chemical insecticides was mainly due to the development of insecticide resistance in pest populations, which were constantly under pressure from these pesticides.

By 1946, only a few years after the first use of DDT, flies resistant to DDT were discovered. One year later a

similar phenomenon was recorded for mosquitoes. The hope that we could perhaps eliminate those insects that were pests to humanity, therefore reducing mankind's suffering, dissipated very quickly.

The very high level of resistance of world insect pest populations to these chemical insecticides caused their use to be discontinued. Insecticide resistance by insect populations continues to threaten the use of many other pesticides today.

With the loss of some pesticides, many experts became fearful and anxious that mankind would not have any means to fight dangerous vectors of disease. In contrast to the view and vision of Rachel Carson that the use of insecticides might bring an end to nature, the phenomenon of insect resistance severely threatened humanity with a potential insecticide shortage that could ultimately threaten mankind itself.

Modern Pest Management Emerged from Concerns

Fortunately, neither of these two horrifying visions came to fruition. But they did point to the danger of chemical insecticide misuse on the one hand and the need for research and development of alternative methods of insect control on the other. These two contrasting visions gave rise to major changes in the public attitude toward pest management.

In the mid-1970s, the problem of pests was considered under a new approach: integrated pest management, or IPM. This includes pest prevention, monitoring, identification and then, only when really necessary, implementation of methods of pest control, with the option of using chemical insecticides as the last resort.

Since the beginning of the 1970s, the trend has been to develop insecticides toxic to pests but with low toxicity to humans and other animals, and with short residuals left in nature.

In 1981, formulations of insect growth regulators, or IGRs, appeared. These synthetic substances mimic the activity of normal biological substances in the insect body. These substances are absorbed into the insect system and disrupt natural processes that lead to insect death. IGRs are directed only toward the pest insect, so they are environmentally friendly and do not harm other fauna or mankind.

New formulations have also been incorporated into insect control. Microencapsulated formulations release active ingredients slowly, so the number of applications can be reduced.

Baits are extensively used for control of cockroaches, ants and termites, which reduces the need for widespread spraying. Baits are either used or are under consideration for control of sand flies, mosquitoes and other pests.

Considerable research has been carried out and is ongoing on the biological control of insect pests. Only a few candidates have been



found to be suitable for controlling medical pests. The most impressive success is the use of the bacterium *Bacillus thuringiensis israelensis*, or *Bti*, in the selective control of mosquito larvae in water. This bacterium was discovered in Israel by Professor Joel Margalit in 1977 and is now widely used in many countries around the world.

Another example of the success of biological control is the use of the carnivorous fish gambusia, which can eat a great number of mosquitoes and is widely used by mosquito control districts and other organizations.

THROUGH technological developments, it is now possible to make significant environmental changes in affected areas in order to eliminate pests without any use of chemical insecticides. For example, draining water bodies or clearing rivers blocked by vegetation allows the water to flow freely, preventing the formation of breeding sites for mosquitoes.

Monitoring activities have become an essential element in pest management, and there have been impressive developments in monitoring methods in the last few decades.

The goal of monitoring is to locate the focus of an infestation at the lowest possible initial levels. Successful monitoring enables focused, effective and immediate treatment, with a minimal use of insecticide only when absolutely necessary.

The Legacy of Silent Spring

The apocalyptic description envisioned by Rachel Carson of the destruction of fauna and flora through the use of chemical insecticides did not become a reality. Rachel Carson would probably be happy that her predictions did not come true. She wrote: "The concepts and practices of applied entomology, for the most part, date from that Stone Age of science. It is our alarming misfortune that so primitive a science has armed itself with the most modern and terrible weapons, and that in turning them against the insects it has also turned them against the earth."

In fact, entomologists are aware of the dangers raised by Rachel Carson and others. New methods and tools that are more friendly to man and the environment have been developed. Although we still have much to accomplish, pest management professionals have found a "happy medium" way to control pest insects using the minimum amount of insecticides.

The activities and views of Rachel Carson were greatly criticized by scientists and others. But her book was undoubtedly the reason that much of the world took notice of the negative influence of some chemical insecticides. Ms. Carson should be credited with advancing the global movement to improve environmental quality on earth.

Rachel Carson deserved the Presidential Medal of Freedom, one of the highest civilian honors in the United States, awarded to her posthumously in 1980 by then-President Jimmy Carter. Two years after her book was published, Rachel Carson died from a heart attack due to complications of breast cancer.

In 1915 American entomologist Stephen A. Forbes wrote that "since the world began, we have never yet exterminated — we shall probably never exterminate — so much as a single insect species." Unfortunately, unlike Ms. Carson, Mr. Forbes may have been wrong. However, the battle between pest insects and mankind will continue, but it will be fought with a minimal use of chemical insecticides and good dose of the research and development of environmentally friendly solutions. **PP**

Amos Willamowski is a Retired Entomologist, Israeli Health Ministry.

Article adapted from the magazine Cuticle, a pest management magazine in Israel, with editing from Roberto Pereira.

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Keep Great People On Your Team

Laura Simis



TODAY'S workforce looks exceedingly different than it did even 10 years ago. Modern employees — okay, we'll say it: "Millennials!" — have an entirely different set of skills and priorities. Those priorities are driving change in the way employees search for jobs, as well as what they value in those jobs.

As demand for pest control services increases, the number of employees entering the pest control industry has tapered off. In fact, you'd be hard-pressed to find a PCO who hasn't faced challenges with hiring in the last 12 months. But oftentimes the struggle to bring in new talent can overshadow the importance of investing in and retaining top performers who are already on your team.

Turnover comes at a high cost for your business. From lost time and lost knowledge when employees leave, to the time and money invested in sourcing new talent, you can't afford to lose good people.

The experts at Forgedly, a people management and hiring platform designed specifically to help pest control business owners find, hire, train and keep great employees, outlined some of the top reasons your technicians leave and some tactics to make them stay.

What Makes Great Employees Go?

Are you firmly and stubbornly planted in the "a paycheck is enough" camp? The paycheck is important, but if you can't keep



your best employees engaged, you can't keep your best employees.

And while employee turnover is a very natural part of running a business, there are a few things to look out for if your best technicians always seem to jump ship.

NO OPPORTUNITIES for GROWTH

Are you letting your most driven and passionate technicians stagnate?

Millennial employees are especially motivated by opportunities for growth. Entry-level employees may already have their eyes on a management role. You can nurture that by showing them what it will take to get there.

Growth doesn't always have to come in the form of a promotion or a raise. It can be additional responsibilities, education or special projects. Just remember, development is not a perk. It's expected. If you're not willing to invest in the potential you see in your team members, they're not going to invest time at your company.

Try:

- Mapping career tracks for entry-level positions at

your company, so that team members can see a clear path to move up.

- Creating Forgedly exams to train technicians with initiative on additional pest certifications or to develop soft-skills trainings on leadership and communication.
- Implementing coaching into regular reviews or one-on-one meetings. Ask your team what their personal and professional goals are, then continue checking in to hold them accountable for working toward those goals.

LACK of AUTONOMY

Pest control can be a grueling job. Climbing through a crawl space or doing heat treatments in July aren't how most people would prefer to spend their days. But there are plenty of technicians who love the work because it gives them a chance to solve problems and make a difference for customers.

Some business owners have trouble relinquishing control. Spending all your time looking over your team's shoulders is bad for your own time management. It also has adverse effects on morale. If you're not providing

strong training and guidance on expectations, then trusting your technicians to make the right call, your top performers are going to leave.

Try:

- Prioritizing the creation of processes. With well documented standard operating procedures, you can trust that your team will know how to address any situation out in the field.
- Focusing on customer service training or active problem solving as part of an ongoing curriculum for all employees.

What Makes Great Employees Stay?

While financial compensation and benefits can't be overlooked, it's also important to invest in making sure your employees feel engaged and valued.

RECOGNITION and FEEDBACK

In a world full of instant gratification, younger employees are hungry for consistent feedback so they know how they are meeting expectations. Don't let your team wait until their annual review to hear how they're doing!

Getting into the habit of regular feedback can help you course correct when an employee isn't meeting standards and keep your employees in the know of what they're doing well or how they can go above and beyond. Publicly recognizing accomplishments and great performance also reinforces good behavior and makes hard workers feel valued.

Continued on Page 31

Chapters 482, 487 and 388: Questions?

I RECEIVE a lot of questions about the Structural Pest Control Act, Florida Statute Chapter 482 and the Florida Administrative Code Chapter 5E-14 and how they relate to chapters 487 and 388.

If you are operating a pest control business or have a limited certificate in Lawn and Ornamental, Structural, Commercial Landscape Maintenance, Commercial Wildlife, or Urban Commercial Fertilizer Applicator then you are operating under Chapter 482 and 5E-14. This is pest control associated with structures and lawn and ornamentals. Not agriculture.

If you have a Private, Public or Commercial Applicator License, then you are operating under Florida Statute 487 and Florida Administrative Code Chapter 5E-2, and 5E-9. This is pest control associated with agriculture. These licenses do not allow the applicator to operate a structural pest control company.

If you have a Public Health License, then you are operating under Florida Statute Chapter 388 and Florida Administrative Code Chapter 5E-13. This pest control is associated with wide areas of public land and aerial applications.

The Florida Department of Agriculture and Consumer Services (FDACS) conducts licensee, applicator and pesticide use inspections for each of these categories. When you are being inspected by an

FDACS inspector be sure he/she is basing their inspection on the proper Florida Statute for the type of license you are operating under.

For further information on the license category you operate under, consult the proper Florida Statute. **PP**

Report by Paul Mitola, Environmental Consultant

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Featured Creatures Update

New and Exciting Insect and Spider Profiles On UF/IFAS Featured Creatures!

Jennifer Gillett-Kaufman

OVER THE LAST few months we have had some exciting additions to the *Featured Creatures* website. There you will find many more new creatures than I can list here. Look them over, and see what you can learn that will help you answer our favorite question: “Can you tell me what this is?”

We are proud to present you these *Featured Creatures* articles from the University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) *Featured Creatures* website. These articles were developed by UF scientists, students, and collaborators. The excerpts below are from the actual article.



#1 Poinsettia Thrips, Impatiens Thrips

Babu Panthi, Oscar Liburd, and Justin Renkema

http://entnemdept.ufl.edu/creatures/orn/thrips/Echinothrips_americanus.html

ECHINOTHRIPS AMERICANUS Morgan is an important greenhouse foliage pest of vegetable and ornamental plants. This pest is polyphagous, reported from 48 plant families worldwide. The preferred hosts of *E. americanus* belong to the Araceae and Balsaminaceae plant families. This pest is native to eastern North America and was first reported in 1984 on poinsettia, *Euphorbia pulcherrima* (Euphorbiaceae), in Georgia. Other important greenhouse crops damaged by this pest include *Impatiens* spp. (Balsaminaceae), gerbera, rose, sweet pepper, cucumber and eggplant.



#2 Brazilian Peppertree Thrips

Patricia Prade, Carey R. Minter, and James P. Cuda

http://entnemdept.ufl.edu/creatures/beneficial/Pseudophilothrips_ichini.html

BRAZILIAN PEPPERTREE THRIPS, *Pseudophilothrips ichini* (Hood), is an insect native to Brazil. This species has been studied for over 20 years as a potential biological control agent of Brazilian peppertree, *Schinus terebinthifolia* Raddi, in Florida. Host specificity experiments demonstrated that *Pseudophilothrips ichini* has a limited host range and can cause a severe reduction of Brazilian peppertree biomass.



#3 Striped Lynx Spider

Laurel B. Lietzenmayer, Ronald D. Cave, and Lisa A. Taylor

http://entnemdept.ufl.edu/creatures/misc/spiders/striped_lynx.html

THE STRIPED LYNX SPIDER, *Oxyopes salticus* (Hentz), is a small, spiny-legged spider and generalist predator that feeds on a wide variety of insect prey, including several economically important insect pests.

This lynx spider species is one of the most abundant beneficial spider species in gardens, yards, and agricultural fields

throughout North America. Lynx spiders get their name from the catlike hunting behavior of ambushing or slowly stalking and pouncing on prey. As a cursorial spider that does not make webs to capture prey, the striped lynx spider instead uses silk to protect its eggs and make silk supports for resting on vegetation.

The name *salticus* stems from the Latin word *saltus*, meaning jumping. This is a fitting name because of its interesting behavior of waving its front pair of legs and jumping rapidly and frequently through vegetation.



#4 Orchard Orbweaver, Orchard Spider

Don Hall

http://entnemdept.ufl.edu/creatures/misc/spiders/Leucauge_argyroabpta.html

THE ORCHARD ORBWEAVERS, *Leucauge argyroabpta* (White), photo above, and *Leucauge venusta* (Walckenaer), are attractive, small spiders and collectively are some of the most common spiders in the eastern United States.

The name orchard orbweaver is the common name accepted by the American Arachnological Society Committee on Common Names of Arachnids for these species, but they have also been called simply orchard spiders. Orchard orbweavers belong to the family Tetragnathidae, the longjawed orbweavers.

Continued

Jennifer Gillett-Kaufman is *Featured Creatures* Editor and Project Coordinator, University of Florida/IFAS Entomology and Nematology Department. Visit the *Featured Creatures* website to read the complete articles at <http://entnemdept.ufl.edu/creatures/>



#5 Rusty Spider Wasp
Sarah Anderson and Andrea Lucky
<http://entnemdept.ufl.edu/creatures/misc/wasps/rustyspiderwasp.html>

THE RUSTY SPIDER WASP, *Tachypompilus ferrugineus* (Say), is a large, reddish orange wasp with conspicuous iridescent blue to violet wings. Aptly named, the rusty spider wasp specializes in hunting large spiders which it paralyzes and provides for its offspring to consume. These eye-catching wasps can be seen scanning loose soil for spider burrows, nectaring at flowers, or dragging large spiders back to their nests.



#6 Giant Burrowing Mayfly
Alexander B. Orfinger and Andrea Lucky
<http://entnemdept.ufl.edu/creatures/aquatic/mayfly.html>

THE GIANT BURROWING MAYFLY, *Hexagenia limbata*, is one of the most widespread mayflies in North America and is well known for its importance in ecosystem health and water quality monitoring. The mayflies, order Ephemeroptera, are an ancient lineage of aquatic insects originating more than 300 million years ago. Within this order, the burrowing mayflies of the family Ephemeridae are well known for their importance in fly fishing and their massive, synchronized mating flights.



#7 Flea Beetles of the Genus Altica
Eleanor F. Phillips and Jennifer L. Gillett-Kaufman
http://entnemdept.ufl.edu/creatures/orn/beetles/flea_beetle.html

FLEA BEETLES are in the largest subfamily, Alticinae, of the family Chrysomelidae, or leaf beetles. The name *Altica* is derived from the Greek word *haltikos*, which translates to good jumper. Although this group is named flea beetles, this is not because the body resembles fleas, but rather because they have strong hind legs, allowing them to jump long distances like true fleas, Siphonaptera. Their great jumping skills are thought to have evolved as a mechanism to escape from predators.



#8 Giant Black Water Beetle
Tanner Felbinger, Oliver Keller, and Andrea Lucky
http://entnemdept.ufl.edu/creatures/misc/beetles/water_savenger_beetle.html

THE GIANT BLACK WATER BEETLE, *Hydrophilus triangularis*, is the largest aquatic-dwelling beetle in the United States. Commonly seen across the continental United States, this beetle has the widest distribution in the genus *Hydrophilus*. This beetle needs fresh water to reproduce and prefers to dwell in large, deep ponds.

The larvae prey upon small invertebrates such as insects and snails, but can also consume tadpoles and small fish. As adults, these beetles scavenge on decaying plant material and detritus in fresh bodies of water. In addition, *Hydrophilus triangularis* adults are predators on smaller aquatic insects, small fish, and snails.



#9 Brown Marmorated Stink Bug
Cory Penca and Amanda Hodges
http://entnemdept.ufl.edu/creatures/veg/bean/brown_marmorated_stink_bug.htm

THE BROWN MARMORATED STINK BUG, *Halyomorpha halys* (Stål), is an invasive stink bug first identified in the United States near Allentown, Penn., in 2001. In the United States, the brown marmorated stink bug has emerged as a major pest of tree fruits and vegetables, causing millions of dollars' worth of crop damage and control costs each year.

The brown marmorated stink bug has also become a nuisance to homeowners due to its use of structures as overwintering sites. The significance of the brown marmorated stink bug has resulted in a large body of academic, government and private-sector research focused on its control.



#10 American Grass Mantid
Jamba Gyeltshen, Amanda Hodges, and Clayton Bania
http://entnemdept.ufl.edu/creatures/orn/beetles/japanese_beetle.htm

THE JAPANESE BEETLE is a widespread and destructive pest of turf, landscape and ornamental plants in the United States. It is also a pest of several fruit, garden and field crops. Adult Japanese beetles feed on foliage, flowers and fruits. Leaves are typically left with only a tough network of veins.

The larvae, commonly known as white grubs, primarily feed on roots of grasses often destroying turf in lawns, parks and golf courses. The Japanese beetle is the most widespread pest of turfgrass and costs the turf and ornamental industry approximately \$450 million each year in management alone. **PP**



Risky Business

Allen Fugler

ASLEEP AT THE WHEEL

Drowsy Driving

ACCORDING to the National Highway Traffic Safety Administration, every year about 100,000 police-reported crashes involve drowsy driving. The real number may be much higher, however, as it is difficult to determine whether a driver was drowsy at the time of a crash.

A similar study by the American Automobile Association Foundation for Traffic Safety estimated that 328,000 drowsy driving crashes occur annually. That's more than three times the police-reported number. The same study found that 109,000 of those drowsy driving crashes resulted in an injury, and about 6,400 were fatal.

The AAA also reported that 41 percent of drivers admit to having fallen asleep at the wheel, and that 21 percent of fatal crashes were drowsy driving related.

In my three years with HIIG-CRU, the leading insurer of all lines of pest control insurance, I have seen 12 claims in which the pest control driver claims to have fallen asleep while driving. I have some suspicion that in some of the claims the technician was using a cell phone, but is that really any better an admission and excuse for causing an accident?

Being awake for 18 hours affects your reaction time similarly to driving with a blood alcohol concentration, or BAC, of 0.08 percent, which is legally drunk in all states. Many researchers now compare drowsy driving to drunk driving:

- Losing even two hours of sleep is similar to the effect of having three beers.
- The crash risk for driving on four to five hours of sleep is more than four times higher than someone who has slept seven hours.

DROWSY DRIVING is now a criminal offense in New Jersey. In 2003, the state enacted Maggie's Law, which states that any driver who causes a fatality while knowingly fatigued may be prosecuted for vehicular homicide. If convicted, a sleep-deprived driver can be sentenced to up to 10 years in prison and fined up to \$100,000.

Maggie's Law was named for 20-year-old Maggie McDonnell, a college student who died in 1997 when a vehicle driven by Michael Coleman swerved across three lanes and hit her car. Coleman told authorities he had not slept for 30 hours. He was ultimately cited for reckless driving

and fined \$200 — the maximum sentence at the time. Public outcry and a campaign by Maggie's family changed the law in New Jersey — the only state thus far to criminalize fatigued driving, which is defined as driving with no sleep within 24 hours.

Drowsy driving affects everyone, but especially those under age 25, who make up an estimated 50 percent or more of drowsy driving crashes. This demographic is often composed of college students and young adults, many of whom believe that they are immune to sleep deprivation and its damaging effects on driving skills. This demographic is also a large portion of pest control technicians hired in the industry, so you should be aware of driving performance and be proactive in preventing drowsy driving.

Pest control work is sometimes similar to shift work: night shifts, long shifts, rotating shifts, or irregular shifts, based on pest seasonality and the type of control work performed. Technicians' schedules may require them to work during the night, a time when we are biologically programmed to be less alert.

Because of their schedules, they may find it difficult to get seven to nine hours of sleep a day. Fatigue can build over days and weeks for every hour of lost sleep, creating a "sleep debt." Those hours of lost sleep create "IOUs" that will be paid eventually, sometimes during the workday and while the technician is driving. The only way to keep alert and driving with peak performance is adequate sleep.

WAYS TO REDUCE DROWSY DRIVING

- **Crash avoidance technologies:** New and existing safety technologies such as drowsiness alert and lane departure warnings can detect common drowsy-driving patterns and warn drivers to stay in their lane or take a break. GPS installed on mobile devices and in service vehicles can monitor the location of vehicles. Technologies are improving to the point that a vehicle's placement in travel lanes is possible. Frequent hard breaking notifications can be set to provide an audible warning to drivers and alerts to fleet managers. Hard breaking can indicate that drivers are nodding off or are using mobile devices while driving.

THE FOLLOWING are signs and symptoms of drowsy driving, according to the American Academy of Sleep Medicine:

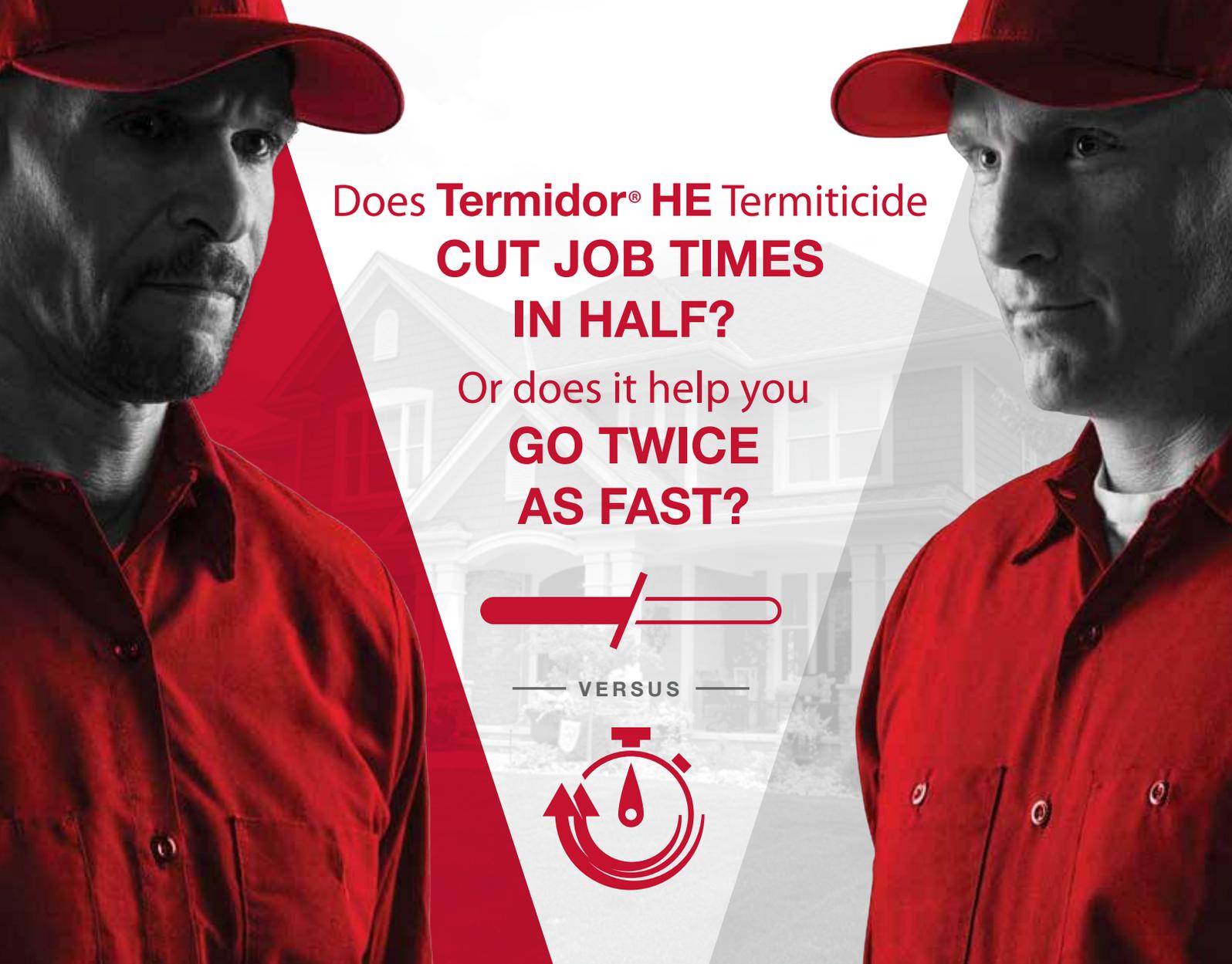
- ✓ Frequent yawning or difficulty keeping your eyes open
- ✓ "Nodding off" or having trouble keeping your head up
- ✓ Inability to remember driving the last few miles
- ✓ Missing road signs or turns
- ✓ Difficulty maintaining your speed
- ✓ Drifting out of your lane

- **Get more sleep:** According to the American Academy of Sleep Medicine and the Sleep Research Society, adults should get seven or more hours of sleep each night. There really are no exceptions to this biological fact. Sleep disorders such as sleep apnea or narcolepsy should be addressed before they create a driving safety hazard or eventually a chronic health issue.
- **Medication labels:** A 2015 article by *Consumer Reports* found that side effects warnings are not always clear; new labeling guidelines may help drivers understand when to drive or not drive after taking these medications.
- **Employer support:** Workplaces with strong off-the-job safety and health programs include key information on getting sufficient sleep and refraining from driving drowsy.

FATIGUE AFFECTS EVERYONE every day, which means managing fatigue in the workplace can play a vital role in reducing the number of drowsy drivers on the roads. You should learn about fatigue in the workplace, its costs, its causes, and how fatigue can lead to a higher rate of safety incidents.

I encourage you to share the *Avoiding Drowsy Driving* resources of the National Sleep Foundation with your technicians at an upcoming training meeting. You can also contact me, Allen Fugler, director of risk management, at (407) 241-3037 or afugler@hiig.com to schedule a driver safety training session during which drowsy driving and other safety issues will be addressed. **PP**

Allen Fugler is Director of Risk Management and HIIG Xterminator Pro at Houston International Insurance Group.



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Keep Great People, continued from Page 25

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- Featuring shout-outs from happy customers in the office or on social media.
- Implementing regular reviews on a monthly or quarterly basis. Forgyly makes it easy to create, schedule and execute inspections and reviews so your team always knows how their performance stacks up.

A POSITIVE WORK ENVIRONMENT

One-third of employees in the United States say they would give up \$5,000 a year to be happier at work.

Workers have a different relationship with their careers today than any generation prior. Younger workers place more value on meaningful work and experiences that leave them feeling fulfilled, so they're less likely to tolerate a job that they are unhappy in just for the money.

Continued on Page 34

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**Ward's Small and Large Pickup Segments compared, 2019 Frontier vs. latest in-market competitors. Based on lowest MSRP models. Price is Manufacturer's Suggested Retail Price (MSRP). MSRP excludes tax, title, license, destination/handling fees and optional equipment. Dealer sets actual price. Comparison based on manufacturer websites.

EUTHANASIA

After a nuisance iguana is captured, the question is what to do with it. Because of the large numbers of nuisance iguanas being captured there are limited live donation options available to homeowners. Many wildlife care centers and wildlife rehabilitators don't have the room or resources to care for iguanas. This means that euthanasia is the most humane method of disposal.

These recommendations are from the *Guidelines for Euthanasia of Nondomestic Animals*, produced by the American Association of Zoo Veterinarians. The Florida Fish & Wildlife Conservation Commission allows euthanasia of nuisance vertebrates, provided

any euthanasia shall be humane as defined by the American Association of Zoo Veterinarians.

Euthanasia is not recommended for use by homeowners or the general public. These recommendations are for pest management professionals and can be used by homeowners that choose to euthanize and need to do so legally and humanely.

Recommended Method of Euthanasia For Iguanas

Sodium pentobarbital IV or IC followed by decapitation or deep freezing. This method requires training and certification in lethal injection, and this compound is a controlled substance.

Conditionally Acceptable Methods of Euthanasia for Iguanas

- Carbon dioxide chamber, if meat is to be consumed.
- Halothane, isoflurane or sevoflurane administered by a veterinarian.
- Stunning followed by decapitation.
- Shooting or stunning with a captive bolt gun, followed by decapitation.
- Cervical dislocation, only on small juveniles weighing less than 100 grams.

Unacceptable (Inhumane) Forms of Euthanasia for Iguanas

- Drowning
- Freezing without prior deep anesthesia
- Decapitation alone is inhumane because a reptile's brain may remain active for up to a minute following decapitation.

We recommend the hiring of a nuisance wildlife management professional to trap and dispose of nuisance iguanas, because the public usually has difficulty performing humane euthanasia.

SHOOTING

Hunting with firearms is a very effective way to harvest iguanas for food in Central and South America. However, it is not legal or safe to discharge firearms or pellet rifles in suburban environments of South Florida where iguanas are commonly causing problems. Shooting is not recommended.

Using a bow with tethered fishing arrows may be legal, but the humaneness is debatable. Slingshots with small pebbles or palm fruits may be a useful harassment tool, but should only be used under adult supervision and when you are very sure of your backstop.

Rubber-band guns have been used by scientists to collect small lizards and may stun juvenile iguanas long enough to capture them by hand. Check with local Florida Fish and Wildlife Conservation Commission officers or local law enforcement before using any projectile weapon.

EATING

The meat of adult iguanas and the eggs are eaten and considered a delicacy throughout their native range, especially during Easter week. Large adults, too dangerous to be kept as pets, may have value as meat in ethnic markets that cater to immigrants from Central and South America. However, make arrangements with the market manager before showing up with a sack of iguanas. **PP**

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

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Keep Great People, continued from Page 31

Remember, it's not enough to say that a positive and respectful workplace is important to you. The way you treat your employees day in and day out has to reflect that. A monthly pizza party isn't going to fix a broken company culture.

Try:

- Incorporating a fun event each quarter to give your team a chance to bond away from the day-to-day of normal work.

- Encouraging the team to leave kind words for coworkers who made their day. Notecards on a bulletin board or sticky notes on a whiteboard take minimal effort but have a big impact.

TRANSPARENCY

When you're in the midst of the busy season, it seems efficient to send employees out in the field quickly and move on, but leaving out the big picture can

be a big deal breaker. If you want technicians to care about their work and the results they deliver, they need to understand the purpose.

Make sure your employees understand why the work they're doing is valuable to customers, to the team, and to the bottom line of the company as a whole! If you're not providing purpose to your driven employees, they'll find one elsewhere.

Try:

- Hosting monthly or quarterly meetings to share overall company performance and highlight department successes.
- Creating dashboards or other ways of keeping employees in the loop on company goals and the progress being made toward those goals. Being able to see progress gives your team ownership over the part they play in reaching those goals.

Retaining great employees isn't just critical to your hiring efforts, it's also critical for your bottom line. You cannot successfully grow your business without happy, well trained employees. Team members who feel valued and engaged in the work they are doing deliver better service, receive better customer satisfaction scores, and contribute to the overall health and success of the company. **PP**

Laura Simis is Branding & Communications Manager at Coalmarsh.



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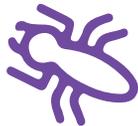


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FumigationFacts.com gives homeowners what they want most — information.

Customers ask questions because they need your help to make a decision. Use **FumigationFacts.com** to help them learn more. It contains all the details about fumigation to eliminate drywood termites — and much of it applies to bedbug fumigations too. The site also features the Fumigation Planning Guide and simple videos that show, not just tell, how it works.



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