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STATE OF THE COCKROACH MARKET

FEATURING

- RESULTS OF COMPREHENSIVE COCKROACH SURVEY
- EFFECTIVE TREATMENTS FOR COCKROACH CONTROL
- THE CAUSE OF CALLBACKS
- NEVER-BEFORE-SEEN RESEARCH
- COCKROACHES AND PUBLIC HEALTH: WHAT YOU CAN DO TO HELP
- NPMA/AAFA CAMPAIGN BUILDS ASTHMA AWARENESS
- HOW DO IGRs WORK?

STATE OF THE **COCKROACH** MARKET

COCKROACH CLOSE UP

In a comprehensive survey of the cockroach market, pest management professionals weigh in on the pests, the control methods, and what drives this essential service.

BY ANNE NAGRO

Cockroaches may not be the sexy pest-of-the-moment, like bed bugs, but they do provide steady revenue for most pest management professionals.

According to a survey by Readex Research on behalf of PCT magazine, nearly 50% of PMPs said cockroach control makes up 16 to more than 30% of their overall service revenue.

They expect this number to increase: 39% said revenue generated by cockroach services will increase in the coming year.

Alan Farmer, owner of FarmerGuard Pest Control in Helena, Ala., saw “a tremendous amount of growth.” Cockroach work accounts for 60% of his pest control (not total) revenue, “considerably more than any previous

year,” he said.

That’s not bad, considering 75% of PMPs said cockroach service made up the same or a smaller portion of their overall business these past five years. A quarter of PMPs saw the amount of cockroach work increase.

Caleb Walker, president of Walker Lawn & Pest Management in Travelers Rest, S.C., said the number of roach calls has grown but the percentage of revenue they represent, about 10%, remained constant.

At American Pest Management in Manhattan, Kan., the number of first-time calls requesting roach control went up in the last two years, said CEO Ravi Sachdeva. “We expect this trend to continue.”

Some increase is due to company expansion. As Payne Pest Management in Van Nuys, Calif., has grown so has its roach control service. Sterling Barbour, who heads the seven-year-old company’s sales and marketing efforts, expects it to increase 10% in coming years.

Killingsworth Environmental in Indian Trail, N.C., saw its number of German cockroach jobs rise after entering the commercial market 18 months ago.

WHO MARKETS COCKROACHES?

According to the survey, 54% of PMPs actively market cockroach control services. In marketing efforts, they cite integrated pest management (60%), service guarantees (53%), certified technicians (51%), health/safety benefits (45%), excellent control (45%), free inspections (43%), monthly service (38%), eco-friendly products (28%), and low prices (14%).

Farmer said a “hot button” for customers is the fact cockroaches are the number one cause of childhood asthma in inner city homes. He also educates potential customers on other health hazards associated with the pests.

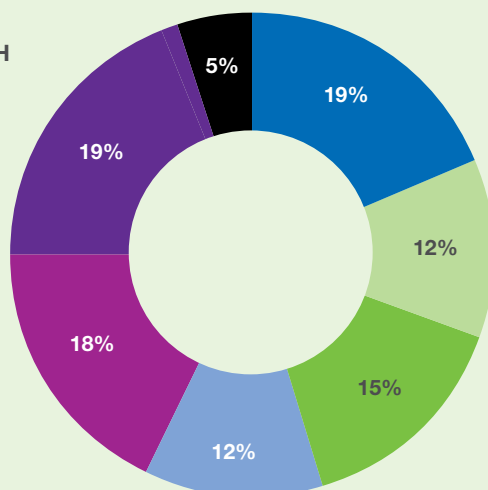
Twice yearly Payne Pest Management sends out information on cockroach control via blogs, said Barbour.

Sachdeva uses social media to promote wood roach control because activity is short lived. With most calls for German roach control coming from mobile homes, he uses door hangers and relationships

PROPORTION OF REVENUE DERIVED FROM COCKROACH CONTROL SERVICES

What percentage of your overall service revenue is generated by cockroach control services?

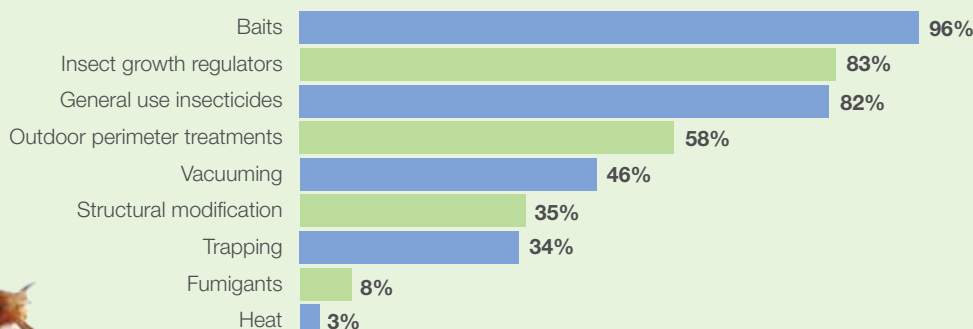
- More than 30
- 21-30%
- 16-20%
- 11-15%
- 6-10%
- 1-5%
- Don't know



Source: Readex Research, August 2013

TREATMENTS USED FOR COCKROACH CONTROL

*What types of treatments
does your company use to
control cockroaches?*



Source: Readex Research, August 2013

with mobile park managers to market the company's services.

Douglas Longfellow, president of Naturzone Environmental Services in Sarasota, Fla., has a webpage and search engine optimization words for cockroach control, but doesn't market the service specifically. Naturzone's message is about getting good results the least invasive way, he said. People in Florida are familiar with roaches; you don't have to create a market for control, he said.

MOST COMMON SPECIES

The incidence of cockroach infestations remained the same over the past year, said 59% of PMPs.

The most-encountered were German (98%), American (86%), Oriental (66%), and brownbanded (53%) species. German cockroaches were said to be the most challenging to control and offer the most significant market opportunity.

Some professionals (28%) saw peridomestic species become a bigger part of their business.

This is true in greater Charlotte, N.C., said Killingsworth Environmental Technical Director Judy Bednar. Landscaping in once-new neighborhoods has matured, and tree canopies and ground covers now provide for moist habitats preferred by the smokybrown cockroach, she said.

Farmer said American, Oriental and

brownbanded cockroaches account for 95% of his cockroach jobs.

Sachdeva mostly deals with German roaches, but earlier this year his region saw an influx of golden wood roaches. "This was unusual because we usually have Pennsylvania wood roaches that fly into open doors and windows in the spring," he recalled. The golden pest's smaller size and lighter color prompted customer calls, he said.

Mark Hunter, president of LandMark Pest and Wildlife Solutions in Macon, Ga., gets fewer calls today for German cockroaches compared to the 1980s and '90s, but more for American cockroaches. He said the latter pest requires a "three dimensional" treatment approach to the perimeter, crawlspace and attic, where he recently found a "huge" infestation while working a bat job.

WHAT ARE SERVICE SPECIFICS?

The majority of PMPs (87%) provide cockroach control services for both residential and commercial clients; 56% said the residential market is their most important.

Monthly service (59%) accounts for most contracts. Summer (45%) is the busiest time of year for cockroach control service.

Only 11% of PMPs said cockroaches were the most difficult pest to control, compared to 53% who cited bed bugs and

26% who said ants.

Nick Lupini, president of Loyal Termite and Pest Control in Richmond, Va., uses German cockroach control as an entry opportunity to bed bug and termite work. He currently services more than 100 apartment complexes.

The average residential cockroach service call takes 30 minutes to an hour, according to 51% of PMPs.

Initial service depends on the level of the infestation. Commercial jobs can take hours, depending on the size of the facility or the number of infested, neighboring units. More than one service call is likely. A minimum of three usually is required for multi-unit housing complexes, said Lupini.

Peridomestic roaches require inside and outside inspection and treatment approaches. Service length depends on the size of the home and landscape vegetation.

WHAT PRODUCTS DELIVER?

The majority of PMPs (54%) have 0 to 5% callbacks on their cockroach services.

Longfellow said integrated pest management approaches and better products contribute to the low numbers.

PMPs use a mix of baits (96%), insect growth regulators (83%), general-use insecticides (82%), outdoor perimeter treatments (58%), vacuuming (46%), structural modification (35%), trapping

STATE OF THE COCKROACH MARKET

The Cause of Callbacks

In follow-up interviews to the State of the Cockroach Market survey, pest management professionals shared many reasons for why callbacks occur.

Douglas Longfellow of Naturzone Environmental Services and Alan Farmer of FarmerGuard Pest Control have had issues with exterior products holding up in challenging weather conditions.

Misidentifying peridomestic species can be a problem, said Judy Bednar, technical director, Killingsworth Environmental. Knowing where to inspect and treat for smokybrown cockroaches is different compared to American cockroaches, she said.

German cockroach control requires a thorough cleanout, such as emptying cabinets and removing clutter, said Bednar. Sometimes customers do not or are unable to cooperate; the task can be physically challenging for some. In these cases, control is a “war of attrition,” Bednar admitted.

Occasionally a “clean freak” customer will spray treated areas with cleaning products, making baits unpalatable, said Caleb Walker of Walker Lawn & Pest Management.

Other times, pests are reintroduced. This is a big challenge in commercial accounts that regularly get deliveries of supplies. Mark Hunter of LandMark Pest and Wildlife Solutions has seen them inside delivery truck instrument panels and crawling out of produce boxes. “You never conquer or finish the job,” he said. “It’s an ongoing process.”

Multi-unit buildings have a constant flow of people (and pests) moving in and out, and residents visiting friends and family in neighboring units, said Nick Lupini of Loyal Termite and Pest Control.



Communicating with customers about their part of the cockroach control program is an important task for pest management firms.

He encourages property managers to put multi-unit buildings on a treatment rotation, but some prefer to call when they have complaints. These jobs usually are more involved because the infestation is more advanced.

So are ones where customers have tried to control the pests for some time with do-it-yourself products, said Louis Pabon of Catseye Pest Control. If a customer tried for six months to a year to fix the problem, she can’t expect professionals to solve it in a visit or two, he said.

Not spending enough time on the job is another reason for callbacks, said Walker. Balancing time and treatment can be difficult

when other events squeeze the day’s schedule.

Of course, sometimes technicians are not as skilled as you’d hope they’d be, said Bednar. It’s important they realize they’re “going to have to do things that are unpleasant,” like crawling on hands and knees and into cabinets, pulling out refrigerators, and inspecting 90-degree attics, she said. “You just have to roll up the sleeves.”

Sanitation was the biggest obstacle to successful control of German cockroaches, agreed PMPs. It is “absolutely vital” and the number-one non-chemical control, said Walker.

But getting customers to improve sanitation is a huge challenge. Many PMPs give customers written prep lists. Farmer spends 25 minutes of a one-hour service call educating customers on issues they must address. “We tell our customers that controlling cockroaches is a 50/50 relationship and they must be on-board or we will almost always fail,” he said.

Yet often they’re not prepared, causing technicians to “waste valuable time,” said Randy Lind of Lind Pest Control. Baits help technicians work around poor sanitation to some degree, but “we cannot promise a great success of the treatment,” he said.

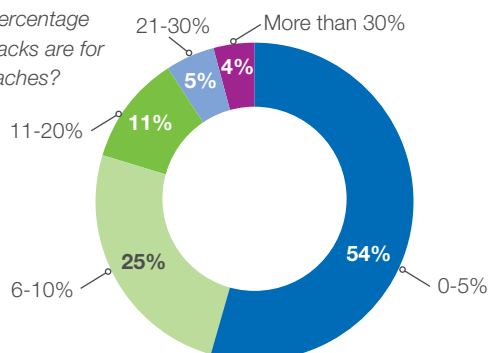
PMPs may need to do some clean up themselves because “ultimately we are going to be judged” on the job’s success or lack thereof, said Ravi Sachdeva of American Pest Management. Find ways to deal with these situations and work around them. “We are business people; we find solutions,” he reminded.

Bednar likes to give customers an “out” so they can move beyond the “stigma of shame” associated with the pests. She does this by telling the client, “You have German cockroaches because someone brought them to you.” It breaks the ice and puts the issue of blame aside so you can communicate openly and start building a partnership, she explains.

Technicians often are embarrassed or worried about talking to customers about conditions that are contributing to the pest problem, said Hunter. Their job is to keep the customer happy; often compensation is tied to this. Employees must be taught how to handle these situations, he said.

PERCENTAGE OF CALLBACKS FOR COCKROACHES

What percentage of callbacks are for cockroaches?



Source: Readex Research, August 2013

The majority of pest management professionals (87%) provide cockroach control services for both residential and commercial clients; 56% said the residential market is their most important. Monthly service (59%) accounts for most contracts. Summer (45%) is the busiest time of year for cockroach control service.

(34%), fumigants (8%), and heat (3%) to control the pests.

Half of PMPs use baits as the primary treatment regimen; 24% rely on general-use insecticides. The preferred formulation is baits (57%), emulsifiable concentrates as sprays (14%), and microencapsulated formulations (13%). The majority of pest management professionals (88%) said low odor was an important factor when treating residential accounts.

Longfellow does old-school crack and crevice treatments to achieve rapid control and baits to maintain it. Randy Lind, president of Lind Pest Control, Tacoma, Wash., believes a spray-bait combination with follow-up maintenance is most effective. "It is nearly impossible to get every last cockroach, but continued maintenance is the best weapon you have to reach that goal," he said.

PMPs agreed today's products are a marked improvement over products of the 1980s and '90s. But some worry about an over-reliance on baits. Thirty-six percent said this was a problem; 41% said it wasn't.

Of those citing over-reliance as an issue, 48% said it compromised technicians' ability. "Baits make it easier for someone who's not quite so thorough," said Longfellow. "People get lazy." He's seen this happen at his own firm. The product is not the solution; it's just one part of it, he reminded. Those who rely on product are applicators, not professionals, he said.

"Every job is unique" and requires "a

unique treatment strategy," added Walker. Tackling jobs in the same manner and expecting the same results is a set up for failure.

Lupini said over-reliance on baits isn't an issue for his four technicians who do apartment work full time. They are paid hourly, well trained, and "looking to advance" to route jobs so work hard to prove themselves and solve problems.

WHAT ABOUT RESISTANCE?

Seventy percent of PMPs are concerned about pesticide resistance.

Most (86%) practice resistance management. The same percent said product rotation is a part of their cockroach protocol.

You always have to be concerned about resistance, said Lupini.

Walker incorporates "all the tools" available, using a combination of baits, liquids and insect growth regulators.

Sachdeva changes prescription materials and methods every three months. "We keep data on the performance of the products we use and make a change as soon as we notice something is not working."

Fifty-two percent of PMPs use four or more different active ingredients to control cockroaches.

Killingsworth Environmental rotates chemical classes, but Bednar said some PMPs are guilty only of rotating *brands* that use the same active ingredient, which doesn't reduce resistance. "I think that

happens quite a bit," she said.


PMPs (51%) said they depend on pesticides the same as they did five years ago. Thirty-five percent claimed they were less dependent on pesticides.

In addition to vacuuming, Lupini uses a portable aerosol system to get product into voids and reduce overall pesticide use. Louis Pabon, technical director of Catseye Pest Control in Castleton-on-Hudson, N.Y., uses cryonite, or freezing, to treat cracks and crevices before applying a residual product in heavily infested accounts.

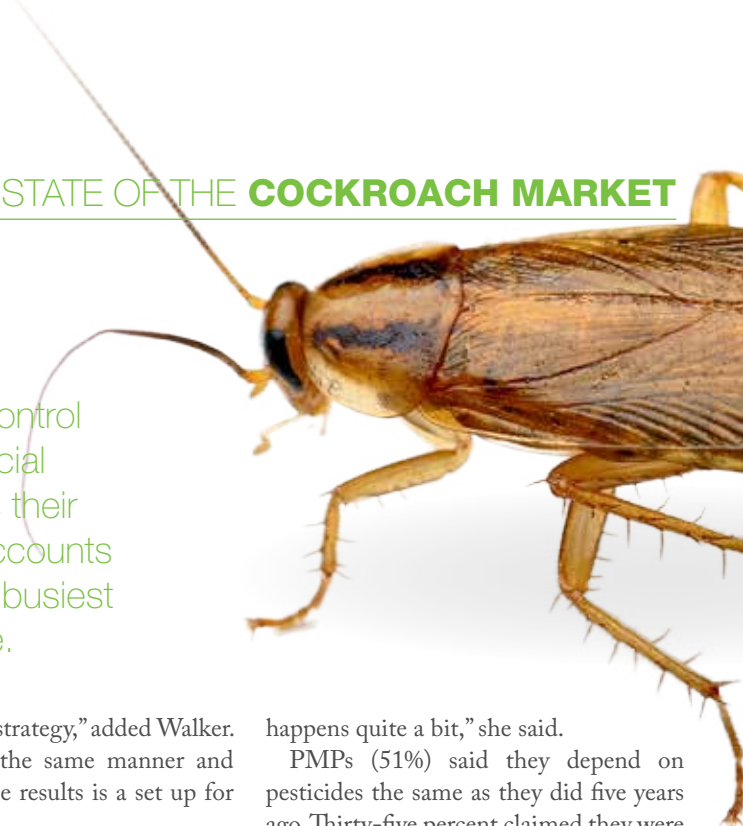
Sixty-eight percent of PMPs are very or somewhat confident technicians follow their resistance management protocol. This depends on good training, communication and follow up by management, said Barbour.

Many pest management professionals "fall in love with a product because it's so effective and they don't want to change," said Pabon. "You can't just keep using the same product over and over again and think you're going to have the same kind of results."

Successful control boils down to doing the basics and doing them well, said Walker.

"Cockroaches have a way of adapting to any circumstance," reminded Pabon. "We have to be able to think like they do and make those adjustments, as well." 

This exclusive research report was sponsored by Zoëcon Professional Products.



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COCKROACHES **BY THE NUMBERS**

About This Survey

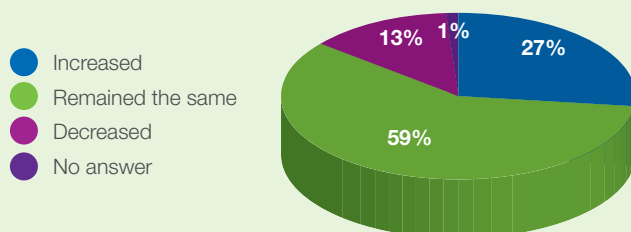
The survey sample of 9,450 was selected by PCT and Readex Research from PCT's circulation, representing all subscribers with email addresses.

Data was collected via an online survey from Aug. 20-28, 2013. The survey was closed for tabulation with 1,036 usable responses — a 12% response rate based on the net effective mail out.

The margin of error for percentages based on 1,036 usable responses is $\pm 2.9\%$ at the 95% confidence level.

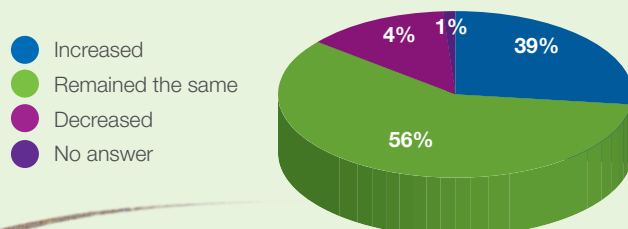
CHANGE IN INCIDENCE OF COCKROACH INFESTATIONS

Over the past year, do you feel the incidence of cockroach infestations has increased, decreased, or remained the same in your market area?



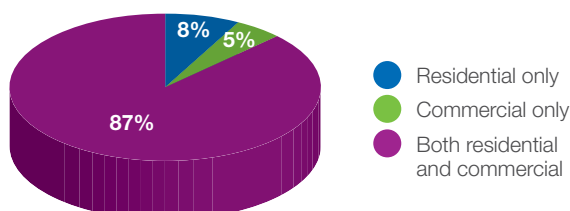
EXPECTED CHANGE IN REVENUE FOR COCKROACH SERVICE

Do you believe the percentage of revenue generated by cockroach services at your company will decrease, increase, or remain the same in the coming year?



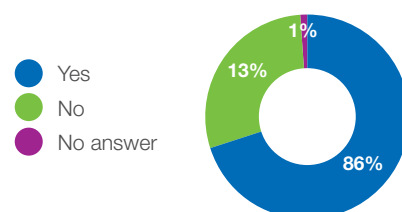
COCKROACH MARKETS SERVED

In what markets do you provide cockroach control services?



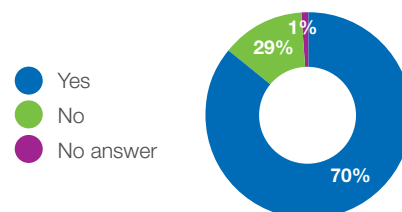
PROPORTION OF PMPs WHO BELIEVE RESISTANCE IS A CONCERN

Is resistance a concern?



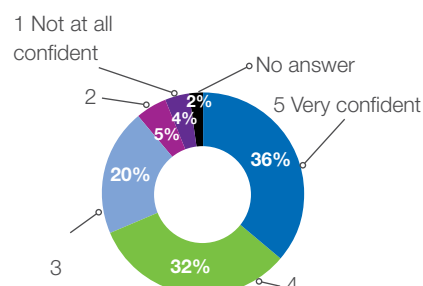
PMPs WHO PRACTICE RESISTANCE MANAGEMENT

Do you practice resistance management?



CONFIDENCE LEVEL OF TECHNICIANS FOLLOWING RESISTANCE MANAGEMENT PROTOCOL

On a scale of 1 to 5, with 5 being very confident and 1 being not at all confident, how confident are you that the technicians in the field follow your resistance management protocol?



Source: Readex Research, August 2013



COCKROACHES AND PUBLIC HEALTH:

Cockroaches by the Numbers

- **1 foot** Wingspan of the world's largest cockroach (South America)
- **3 mph** Cockroaches can run up to 3 miles per hour
- **6** Number of legs on a cockroach
- **7** Number of days a cockroach can live without its head
- **25-30** Number of pest species of cockroaches
- **40** Number of minutes a cockroach can hold its breath
- **75** Percentage of time cockroaches at rest
- **5,000** Number of cockroach species worldwide
- **289 million** Years ago scientists believe cockroaches originated (Carboniferous era)

(Sources: *Discovery Kids*, *Best Fun Facts.com*)

WHAT YOU CAN DO TO HELP

While bed bugs have in recent years demanded their place in the spotlight as the pest of concern in multi-unit urban settings, cockroaches have been working stealthily behind the scenes. Perhaps we'd become a little complacent because our baits were doing such an effective job of holding them at bay, but the reality is that this 300-million-year-old nocturnal pest is once again resurging, building its populations, contaminating people's homes and posing a risk to their health, all while cultivating aversions and resistance to some of our favorite treatment programs.

So let's talk cockroaches – why they threaten the public health and what you and your team can do about them.

Cockroaches commonly breed in areas related to human dwellings – garbage storage areas, sewage systems and septic tanks, for example. They

seek warmth, food and moisture, which tend to be readily available in people's homes. Offer them a multi-unit setting where sanitation is subpar, and you have a formula for infestation – cockroaches crawling through kitchens, bathrooms and beyond, causing issues ranging from embarrassment, disgust and despair to asthma, allergies and food poisoning.

German and American cockroaches are the species most frequently encountered in the urban setting, although brownbanded cockroaches do frequent institutional settings, and Oriental cockroaches occasionally find their way into homes. Research has focused on German and American roaches in efforts to identify technologies to control infestations.

The PMP's role is, of course, to obliterate these bad-smelling, disease-carrying insects. That's easier said than done, as roaches are adaptable and hardy, able to survive 30 days without water and up to three months without food. They

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reproduce prolifically, with egg-laying females capable of producing several thousand offspring in a year. They are also evolutionary geniuses, continually finding ways to physiologically beat our industry's chemistries.

How many homes are actually infested? The Asthma and Allergy Foundation of America (AAFA) reports, depending on location, 78% to 98% of urban homes may have cockroaches, with each home harboring 900 to 330,000 of the insects. Technicians need to always be on the lookout, in the usual places – kitchens and bathrooms – *and* in less likely places.

“Lifestyles have changed; people's

eating habits have changed. They're carrying food to their bedrooms, their family rooms – places in the home where food simply would not have been found a couple of decades ago,” says Dr. Susan Jones, associate professor in the Department of Entomology at The Ohio State University. “This means we need to look everywhere. As food sources become more scattered throughout a home, cockroach populations follow.”

ALLERGENS AND ASTHMA

The most prevalent public health concern related to cockroaches is asthma. Proteins found in cockroach feces, saliva, molted

skins, oothecae (egg cases) and bodies of these insects can be highly allergenic, causing skin rashes and asthma symptoms, which may be triggered when an individual inhales cockroach allergens, ingests food that has been contaminated by the insects or touches cockroach bodies or proteins.

The AAFA reports that up to 60% of urban residents who have asthma are sensitive to cockroach allergens. And the National Pest Management Association (NPMA) says that about 63% of American homes have detectable amounts of cockroach allergens.

The high frequency of exposure to cockroach allergens among inner-city residents, particularly children, has made them the focus of scientific study into the effects of allergens on sensitive individuals. A landmark study published in 1997 (D.L. Rosenstreich) revealed that inner-city children who were allergic to cockroaches (37% of the subjects, all of whom had asthma) and exposed to them were hospitalized for asthma 3.3 times more often and required nearly twice the number of medical visits than other asthmatic children. They also experienced more wheezing, sleep loss and missed days of school.

How can you protect your customers from cockroach allergens? Wipe out the populations – *completely*.

“Anyone with allergies will tell you the best way to fight them is source reduction,” says Dr. Coby Schal, whose research team at North Carolina State University has successfully isolated the cockroach proteins responsible for allergic reactions (see related story). “We have found that the bait products used today are incredibly effective in managing cockroach populations. When used properly, these formulations can eradicate cockroach populations, effectively minimizing the presence of allergens.”

Recognize that your pest management treatments must also include removing the bodies, feces and other protein

NPMA/AAFA Campaign Builds Asthma Awareness



The National Pest Management Association (NPMA) has partnered with the Asthma and Allergy Foundation of America (AAFA) to raise awareness about the link between household pests and health concerns. Specifically, this two-part effort communicates the risks associated with cockroaches and rodents in triggering asthma-related symptoms and causing disease:

1) Facebook – For every new Facebook fan, NPMA is donating \$1 to the Allergy Foundation of America. Facebook users must “Like” PestWorld through the “Take Action” tab on its PestWorld page, www.Facebook.com/PestWorld.

2) Public Service Announcement (PSA) – NPMA and AAFA have collaborated on a PSA speaking to the relationship between roaches and rodents and the public health. The PSA directs viewers to pestworld.org for more information.

“We are glad to work with NPMA to educate the public about the health hazards that pests create for people with asthma and allergies,” said Mike Tringale, senior vice president of AFA. “The support that NPMA has pledged to AAFA as the benefiting charity of this project will help us to advance our nonprofit work.”

“A cause marketing campaign is an excellent way to build brand awareness while educating consumers about an important pest-related issue,” said Missy Henriksen, executive director of the Professional Pest Management Alliance, the public outreach arm of NPMA. “We are excited to partner with the Asthma and Allergy Foundation of America to educate consumers about the importance of reducing pest triggers in homes.”

The PestWorld Facebook page teaches consumers about the health and property risks posed by pests, as well as the importance of working with a qualified pest professional. The page shares prevention tips, links to educational articles on PestWorld.org, conducts polls, shares pest photography, hosts contests and more.



Educate Your Customers

It's important for your customers to understand that there is a direct correlation between cockroach infestations and sanitation. Share this advice with them for preventing or minimizing infestations:

- Keep countertops, sinks, tables and floors clean.
- Clean crumbs, spills and dishes right away.
- Avoid leaving pet food exposed.
- Store food in airtight containers.
- Keep trash in tightly covered cans.
- Eliminate moisture and stagnant water, including checking for and repairing leaky pipes.
- Fill cracks and gaps in walls and floors and in or around cabinets – any opening that might offer access to the outdoors.
- Check grocery items and children's backpacks for signs of cockroaches before bringing them into the home.
- Remove piled-up newspapers, boxes or other cardboard as cockroaches can eat and live in these materials.

important step technicians can take to eradicate cockroach allergens. Also, if sprays are part of your treatment protocol, your technicians must be cautious in their application. Careless spraying into cracks and crevices can stir up allergens, causing them to become airborne menaces to those with cockroach sensitivities.

DISEASE

In addition to causing health issues for people with asthma, cockroaches have been implicated as vectors of pathogens that cause a variety of diseases. The pests have been found to spread as many as 33 kinds of bacteria, including *E. coli* and *Salmonella* species, as well as parasitic worms and *Staphylococcus pneumoniae*, which can cause health issues including pneumonia, ear infections and pinkeye.



“Lifestyles have changed; people's eating habits have changed. They're carrying food to their bedrooms, their family rooms – places in the home where food simply would not have been found a couple of decades ago.” – *Dr. Susan Jones*

Bacteria can be transmitted two ways: mechanically and through feces. While transfer through feces is relatively easy to understand – the cockroach eats contaminated food, which goes through its system and is left on surfaces in the home through its feces – mechanical transmission is a little trickier. How exactly does the insect pick up and move pathogens from place to place?

A revealing study conducted by Koehler's team at the University of Florida found that foodborne pathogens can be carried in the waxy coating on the cockroach's exoskeleton. Biologically, this coating is intended to protect the cockroach by preventing moisture loss. In real-world settings, it can attract and hold bacteria, including many that can

cause disease.

Koehler's researchers exposed cockroaches to *E. coli* 0157:H7, the contagious bacterium widely believed to be responsible for the majority of *E. coli* outbreaks in the United States (estimated to infect more than 70,000 individuals a year). After crawling over food contaminated with *E. coli*, the cockroaches were stripped of their oils. The research team found bacteria embedded in the oils, where they could remain viable for months. On active roaches, these bacteria could then be deposited onto other surfaces as the roaches crawled and the oil wore off.

“Insects with hard waxy coatings aren't as likely to pick up and transfer pathogens,” says Koehler. “But the coating on roaches is extremely permeable –

more oily than waxy. We were able to get our test roaches to transfer the bacteria from one surface to another.”

Schal's N.C. State team discovered antibiotic-resistant microbes on cockroaches they had collected from nearby pig farms, where cockroach populations tend to be plentiful. The genetic makeup of these bacteria was determined to be pathogenic: If transferred to humans, it could cause disease.

Explains Schal: “This study emulated conditions that might be found in a hospital setting. The cockroaches picked up pathogens from the pigs' feces and could transmit those pathogens to humans, who would be at risk to contract a disease that would resist antibiotic treatment.”

sources from the home, adds Dr. Phil Koehler of the University of Florida.

“When allergy concerns came into focus about 15 years ago, the medical community believed we should just be able to spray and cockroach-related asthma symptoms would disappear. But that wasn't the case. If the shed skins and droppings are still in the environment, allergies will prevail.”

Vacuuming with a HEPA filter is an

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“There is no known resistance to IGRs, so they are especially effective in controlling resistant populations. They block the resistant population from reproducing, so you don’t get that build-up of resistance that makes these pests so difficult to manage.” – *Dr. Richard Kramer*

BEST BETS FOR TREATMENT

For the most part, gel baits have been tremendously effective in managing cockroaches. But we all know that cockroaches become resistant to formulations when exposed over time. They also develop aversions to certain ingredients, such as glucose, as documented by Schal earlier this year. Overcoming these challenges means being resourceful: testing for aversion before presenting a bait, and rotating active ingredients to minimize resistance.

“The best available information indicates that a three-month rotation strategy is a solid plan of action. PMPs should rotate through three actives before coming back to the first one,” says Purdue Associate Professor Dr. Michael Scharf. “It also makes sense to incorporate IGRs into baiting programs.”

Many PMPs are doing just that. Fast-acting gel baits, which are designed to kill the roaches, combined with slower-acting but long-lasting IGRs, which prevent insects from reaching a reproductive stage, combine to deliver a one-two punch that’s hard to beat.

“We use baits plus IGRs and monitor our efforts with sticky traps,” says Jay Bruesch, technical director of Plunkett’s Pest Control, Fridley, Minn. “When used in conjunction with conscientious IPM practices, this approach works very well.”

Bruesch suggests rotating pyrethroid and neonicotinoid baits, and building boric acid, diatomaceous earth and silica into treatment protocols. “There is no magic bullet,” he says. “You have to take

into account resistance, aversion and effectiveness, and develop an approach that works with each population. We include boric acid, diatomaceous earth and silica because there is no known resistance to these substances.”

Doug VanGundy, senior research and development director at Central Life Sciences, suggests that before a baiting program is put into place, a higher-powered initial clean-out may be in order. “In large infestations, or in facilities such as restaurants that have not been treated in some time, you might need to pull out the big guns for the initial treatment – a liquid concentrate with an IGR in a compressed air sprayer – to knock the population down quickly and eliminate the possibility of a population rebound.”


Bruesch agrees. “Everyone likes the convenience of baits, but the reality is that sometimes the only thing that works, particularly in situations with significant

Which Bait Should You Use?

When choosing a bait, of course you take into account the active ingredient. You want the active to be part of a thoughtful rotation that minimizes resistance. Also important is testing for potential aversion. If they won’t eat the bait, it isn’t going to work!

Dr. Coby Schal of North Carolina State University recommends a taste test: “Go where the infestation is heaviest and put a dab of each of several baits out. After five minutes, see which bait has attracted the most roaches. Don’t choose your bait based on cost or sales performance; let the roaches decide. They are very good at communicating their food preferences.”

levels of aversion, is the traditional way: spray and dust. It’s hard work, it can be messy, and it depends on the cooperation of your client or resident, but you’ll get the results you want.”


Speaking of cooperation, regardless of the treatment approach you choose, remember that educating your customer about sanitation measures and harborage reduction is always a critical component of treatment success. Educated consumers are your first line of defense. 

How Do IGRs Work?

Insect growth regulators (IGRs) are biopesticides that mimic juvenile growth hormones in insects, altering development and eliminating the possibility of reproduction. Often used in conjunction with baits to manage cockroach populations, IGRs aren’t likely to affect other organisms since they work directly on the hormone pathways of insects.

“There is no known resistance to IGRs, so they are especially effective in controlling resistant populations,” says Dr. Richard Kramer, president of Innovative Pest Management, Brookville, Md. “They block the resistant population from reproducing, so you don’t get that build-up of resistance that makes these pests so difficult to manage.”

“IGRs also provide an immediate benefit: They stimulate cockroaches to come out of harborage and crawl onto your treated surfaces. Our research has also shown a marked increase in feeding activity where IGRs are present. Simply put, cockroaches stimulated by IGRs eat more of your bait.”

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