The

ADVOCATE

A Publication of the Missouri Pest Management Association

FROM THE PRESIDENT

As we wind down the 2013 pest season, and I wind down my time serving on the MPMA board, I want to take the opportunity to say thank you to all I have had the pleasure to work with over the last several years, and a very special thank you to Sandy, who is definitely the backbone of our Association.

It's been motivating to see the new faces each year, of those who are willing to serve, and work for the betterment of all members of this Association.

Our annual meeting is coming up in St. Louis, November 20 and 21st. Thank you for all the work both our education committee and the St. Louis Association put into getting this education session in order. We again have a great line up of speakers for both the Management, and recertification portion of the meeting. The slate of manufacturers, distributors, and industry businesses that support our association every year is strong, and they will be displaying all the new tools of the trade both days.

We look forward to seeing everyone in St. Louis. And after the annual meeting Wednesday night, please feel free to join the Board, and incoming President Jeremiah Ryden, for a complementary happy hour. Let's toast to a great 2013, and for a prosperous 2014!

Bryan

Bryan Ninichuck
MPMA President
wingatepestandlawn@yahoo.com

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Mark Your Calendars

Annual Joint Conference with Missouri Pest Management Association and Greater St. Louis Pest Control Association

Hilton St. Louis Frontenac

November 19-21, 2013

NEWSLETTER OF THE MISSOURI PEST MANAGEMENT ASSOCIATION

Newsletter Editor
Michael Woodring, ACE

Newsletter Publisher
Sandra Boeckman, Executive Director

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CALENDAR
OF EVENTS

2013	
October 22-25	**Pest World 2013** *Phoenix Convention Center* *340 North 3rd Street* *Phoenix, Arizona*
November 19-21	**Annual Conference with Greater St. Louis Pest Control Association** *Hilton St. Louis Frontenac* *St. Louis, MO*
2014	
January 10	**Winter School** *Kansas City Area*
March 7	**Board Meeting** *MPMA Office, Jefferson City*
May 16	**Board Meeting** *MPMA Office, Jefferson City*
August 14-15	**Board Meeting & Recertification** *MPMA Office, Jefferson City*
October 10	**Board Meeting** *MPMA Office, Jefferson City*
October 21-24	**Pest World 2014** *Orlando, Florida*

I'm Tired

By Lloyd Merritt Smigel

Recently one of my clients told me that he would like to retire because he was just getting tired of all of this.

I asked what he meant my 'all of this.'

He proceed to say, "The new laws and regulations, employee turnover, poor economy, the banks are no longer working with me, I work more than ever before, cash flow problems, lawsuit crazy people, can't find anyone who understands what work means – including my own kids – do you want me to go on?"

Can you relate to any of the above? Do you relate to ALL of the above?

If so, let me explain something to you. You see – it's about change and getting out of your comfort zone. The good ol' days are gone. It's over. Now we have to change and that's not easy. The old saying is true – What got you to where you are may not be what will get you to where you want to go.

Over the past 30 years, I have worked with hundreds of Pest Control companies who wanted or needed to change. Most did well. Some just decided to sell and three years later they were sorry.

Change is not easy. However, everything else around us has changed. The economy, the work force value systems, the government – name it – and there have been changes. So if WE don't change – we lose.

Even the Yellow Pages now advertise to buy their Yellow Pages.com – get the message yet?

So we have to get more organized, more structured, defend against lawsuits, change the way we do business. We have to get better software or, here's an idea, learn the new software we bought.

Scheduling has also become a major factor. In case you haven't noticed, the price of gas has gone up. We have to get more organized than ever before. We need less callbacks, better training and we need to get better at our hiring and learn more about Sales Management as well as sales.

That's a lot.

But that's what I do and I can tell you that most companies, with some guidance, can make the changes that are needed to survive and thrive.

However… there are many company's whose upper management are not wanting to change. That's a problem. Unless you have no competition, you will probably lose more and more market share every day. Your leads will dry up and there will be many other pest control companies out there who are changing and getting your shrinking market shares. I see it all the time. Some new kid on the block comes out of no where and in 3-5 years they are as big as you are and it took you 25 years to get there. Where'd they come from? How'd they do it?

It's called Change, my friend. And if you don't get the help and change, you will be still manufacturing the buggy whip and wondering if those new cars will eventually take over the horse and carriage.

Many people KNOW they have to change and wait. They wait a week, a month, a year, many years and still no change. You can wait your entire career for 'the right time to change". The time is NOW. Time to change.

Cell Phone Frustrations

By Nancy Friedman, The Telephone Doctor

Cell phone frustrations remain high even with the enormous use of them around the world. In a recent Telephone Doctor survey, we received the following cell phone 'frustrations' from all over the country. Is yours on this list? There were more; however, these were at the top of the list.

- Talking on a cell phone while conducting business.
- Answering a cell phone while talking to someone else in person.
- Talking loudly in a store/restaurant.
- Not using the vibrate feature when at work or in a public place.
- Talking on your cell phone when you're in the car with others.
- Using your speakerphone in public.
- Initiating a cell phone call when others are present.
- Talking on your cell phone and landline at the same time.
- Using call waiting. What? I'm not important enough to finish our conversation?
- People with 'awful' voice mail messages.
- Not answering when called when we know you're there.
- When the first thing a person asks is, "Where are you?"
- Having to listen to the chirps and weird rings and tones some cell phones make.

So then what are the 5 voice mail frustrations which are probably on your cell phone voice mail right now?

1. Hi, I'm not here/ or not available right now. (DUH. That's a hot lot of news. We know that. That's why your voice mail answered)
2. Your call is very important to me. (Right, then why aren't you there?)
3. I'm sorry I missed your call. (Well sometimes we're not. Besides that's a pretty useless statement.)
4. I'll call you back as soon as possible. (Now what's wrong with that? Well... Your ASAP may be different from my ASAP and we'll never exceed anyone's expectation with ASAP. Simply state "And I will return the call."
5. Not giving caller an 'out' or another way to reach the party; i.e. Another phone number, a person, or an email to locate them.

When was the last time you checked your own message? Probably time to do that.

2013 OFFICERS

PRESIDENT
Bryan Ninichuck, ACE
Wingate Environmental Pest & Lawn Management, LLC
4302 Bold Venture, Ste. A
Columbia, MO 65202
Phone: 573-446-0102
Fax: 573-446-1891

PRESIDENT ELECT
Jeremiah P. Ryden
Gunter Pest Management
220 W. 72nd Street
Kansas City, MO 64114
Phone: 816-523-0777

SECRETARY/TREASURER
Steven C. Arenz, ACE
Arenz Pest Management Solutions
PO Box 1062
Hillsboro, MO 63050
Phone: 636-797-2880
Fax: 636-797-2969

IMMEDIATE PAST PRESIDENT
Jeff Darst
Mr. Bug Killer, Inc.
PO Box 458
Branson, MO 65615
Phone: 417-334-0009
Fax: 417-334-2069

REGION I VP
Jeff Archer

REGION II VP
Mitch Clevenger, ACE

REGION III VP
Mary Kay Husmann

REGION IV VP
Bryan Robertson

REGION V VP
Gary Schuessler

MPMA OFFICE
Sandra Boeckman, Executive Director
722 E. Capitol Avenue, PO Box 1463
Jefferson City, MO 65102
Phone: 573-761-5771
Fax: 573-635-7823

ALLIED REPRESENTATIVE
Greg Clark
WinField Solutions
6101 N. Cypress Avenue
Kansas City, MO 64119
Phone: 816-572-8378
Fax: 816-364-4636

DIRECTORS AT LARGE
Janet Preece
Randy Coleman, ACE
Michael Woodring, ACE
Larry Hodson, Jr.

First Detection of Heartland Virus (Bunyaviridae: Phlebovirus) from Field Collected Arthropods

1. **Harry M. Savage**
2. **Marvin S. Godsey Jr.**
3. **Amy Lambert**
4. **Nickolas A. Panella**
5. **Kristen L. Burkhalter**
6. **Jessica R. Harmon**
7. **R. Ryan Lash**
8. **David C. Ashley**
9. **William L. Nicholson**

Author Affiliations

1. Centers for Disease Control and Prevention, Fort Collins, Colorado; Centers for Disease Control and Prevention, Atlanta, Georgia; Department of Biology, Missouri Western State University, St. Joseph, Missouri

Author Notes

Authors' addresses: Harry M. Savage, Marvin S. Godsey Jr., Amy Lambert, Nickolas A. Panella, and Kristen L. Burkhalter, Arbovirus Diseases Branch, Division of Vector-Borne Diseases, Centers for Disease Control and Prevention, Fort Collins, CO, E-mails: hms1@cdc.gov, mjg9@cdc.gov, ahk7@cd.gov, nap4@cdc.gov, and ktb3@cdc.gov. Jessica R. Harmon, R. Ryan Lash, and William L. Nicholson, Rickettsial Zoonoses Branch, Division of Vector-Borne Diseases, Centers for Disease Control and Prevention, Atlanta, GA, E-mails: jharmon@cdc.gov, rlash@cdc.gov, and wnicholson@cdc.gov. David C. Ashley, Missouri Western State University, St. Joseph, MO, E-mail: ashley@missouriwestern.edu.

Address correspondence to (1.) Harry M. Savage, Centers for Disease Control and Prevention, 3156 Rampart Road, Fort Collins, CO 80521. E-mail: HMS1@cdc.gov

Abstract

Heartland virus (HRTV), the first pathogenic *Phlebovirus* (Family: Bunyaviridae) discovered in the United States, was recently described from two Missouri farmers. In 2012, we collected 56,428 ticks representing three species at 12 sites including both patients' farms. *Amblyomma americanum* and *Dermacentor variabilis* accounted for nearly all ticks collected. Ten pools composed of deplete nymphs of *A. americanum* collected at a patient farm and a nearby conservation area were reverse transcription-polymerase chain reaction positive, and eight pools yielded viable viruses. Sequence data from the nonstructural protein of the Small segment indicates that tick strains and human strains are very similar, ≥ 97.6% sequence identity. This is the first study to isolate HRTV from field-collected arthropods and to implicate ticks as potential vectors. *Amblyomma americanum* likely becomes infected by feeding on viremic hosts during the larval stage, and transmission to humans occurs during the spring and early summer when nymphs are abundant and actively host seeking.

Footnotes

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In The Heat of The Summer

By Lloyd Merritt Smigel

I know, this is the time to bust chops and earn your money. In the Northern part of the country it is do or die. It is the time to make up for your winter loses. It is the time where you don't have time to see salesreps trying to sell you 'stuff'. It is the time for long hours and hard, hard work. I get it.

It is also the time where your employees are working harder than ever and busting THEIR chops. It is the exact right time to have a quick meeting and tell everyone THANKS!

Let them know that you appreciate their hard work and understand that it means less time for their family and friends.

Many companies have vacation policies stating that they can not take vacations during the summer, as it is the time for us to work harder. It is the nature of the business. The heat comes and brings out more bugs. Simple as that. Some companies pay more for employees vacation pay if they take their vacations in the winter.

The point is that it is a tough time to be working in our industry. It's just the nature of the beast. But it's also a good thing for our industry.

The office is processing more paperwork than ever before. Salesreps are selling up a storm, callbacks and New Starts are challenging the service techs and supervisors are out working harder than ever. LOTS of work.

By taking a few minutes and thanking your employees goes a long way. Going out in the field with a six pack of cool sodas shows that you care. Bringing in lunches and paying for it goes a long way. Supplying cold water and ice goes a long way.

I recall going out to my fume crews bringing them cold sodas and even (oh my g-d) working with them brings the message – I'm with you and care – goes a long way.

Some companies work full days Saturdays in the summer time. Occasionally, buy their lunches.
One owner, I know will once a week give each of their employees $10.00 and say "Lunch is on me – you all work hard – I appreciate it."

So, yes, I get it that you have to work hard – but it is the BEST time to take a little time out and let your people know that you appreciate and, more importantly, let them know that you care about THEM.

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Five Ways to Sabotage Your Business

By Nancy Friedman, The Telephone Doctor

There are many, many ways to sabotage your business. And, chances are, your staff is doing some of these now on the phone and in person. And worse yet, you've probably even heard some of this yourself (ouch!). That's the bad news

The good news is we're able to bring to you the top five sabotage practices and then show you how to neutralize the effects. So get ready. You and your staff are about to be in a much better position to handle the Five Ways to Sabotage Your Business today:

1. I Have No Idea
This is normally used as an excuse more than anything else. It's a sure sign that the employee has not been shown how to explain something to the customer. This phrase is used as something to say when the employee doesn't know what to say.

When the customer hears "I have no idea" they immediately respond (usually silently) with, "you gotta be kidding me?" Interestingly enough, there normally is a certain blank stare accompanying this statement. Sad.

2. It's Not My Department
Well, then whose is it? Let's remember one of our Telephone Doctor mottos: Tell the customer what you do, not what you DON'T do. If you get a call and someone asks for something that you don't handle, it's far more effective to say, "I work in the paint department. Let me get you to someone in the area you need."

This is far more effective than telling someone it's not your department. And please don't say, "YOU have the wrong department." Take full responsibility with the "I" statement.

3. I Wasn't Here That Day (or I was on vacation when that happened)
This one really makes me laugh. Does that excuse the company? I don't remember asking them if they were there that day. Do you really think the customer cares if you weren't there when their problem happened? Honestly, they don't, so that's not even an issue to discuss. Just tackle the problem head on. Apologize without telling them where you

were...or weren't. Remember, you ARE the company whether you were at work or on vacation when the issue occurred.

4. I'm New
SO? Okay, you're new. Now what? Does being 'new' allow you to be anything but super to the customer? When the customer hears this sabotaging statement, do you really think they say, "Oh, so you're new? So that's why I'm getting bad service? Well, then that's okay...you're new. Now I understand."

Yes, even if you are new, the customer honestly believes you should know everything about your job.

Here's the Telephone Doctor answer on this one. Tell the customer, "Please bear with me, I've only been here a few weeks." That will buy you time. And a bit of sympathy. For whatever reason, hearing the short length of time you are with the company means more to the customer than, "I'm new." Again, I'm new is more of an "excuse." Remember to state the length of time. It's a creditability enhancement. "I'm new" is a creditability buster.

5. Silence on the Phone or a Blank Stare in Person
I called the doctor's office the other day and asked to change my appointment. It went down like this:

"Hi, this is Nancy Friedman. I have a 9 a.m. appointment with Dr. Ring and I need to move it to later in the day."

Then NOTHING for about 10 - 15 seconds. Zip/nada/zilch.

So I said, "Hello? Are you there?"

A very irritated voice came back with, "I'm checking."

Wouldn't it have been nice for her to tell me that? Ah, if the doctors only knew.

Good luck!

# # #

Nancy Friedman, president of Telephone Doctor, is a featured speaker at association, franchise, and corporate meetings. For a Demo & packet on Nancy, please email Donna.Bryan@telephonedoctor.com Or call 314.291.1012.

What is the Buzz About?

Without question, the hottest pest management regulatory issue these days is protecting bees from unintended exposure to pesticides. Recently adopted and future public policy will impact pesticide use patterns for all user groups including pest management professionals (PMPs).

Honeybees and other pollinators are vital to an abundant food supply. Over the last several years, however, honeybees have been plagued by the mysterious Colony Collapse Disorder (CCD), and beekeepers throughout the world are now fighting for their livelihoods. Some have suggested that the primary culprit is pesticides, while others have stressed the complexity of the issue and the variety of factors involved.

RECENT EPA ACTION

Nothing better underscores the urgency of the bee health issue than the mid-August announcement by U.S. Environmental Protection Agency (EPA) that labels of some neonicotinoid pesticide products would be revised to prohibit applications where bees are present. The changes apply to all products that have outdoor foliar use directions (except granulars) containing the active ingredients imidacloprid, dinotefuran, clothianidin or thiamethoxam regardless of formulation, concentration, or intended user.

The new language that will appear in the Directions for Use section on non-agricultural product labels states "Do not apply [insert name of product] while bees are foraging. Do not apply [insert name of product] to plants that are flowering. Only apply after all flower petals have fallen off." A bee icon to highlight the significance of the label change will accompany the new language.

A Pollinator Advisory Box containing voluntary best management practices will also appear on product labels. Registrants must submit the label changes to EPA by September 30 and the new labels will appear on products in early 2014. This label revision is likely the first in a series of label changes aimed at protecting bees.

While EPA's recent label change is perhaps the highest profile action to limit bee exposure to pesticides, it simply caps off a myriad of worldwide activity over the last several months.

OTHER NOTABLE RECENT REGULATORY/LEGISLATIVE ACTIVITY

In early March, EPA and the U.S. Department of Agriculture (USDA) hosted a Pollinator Summit to bring stakeholders together and to learn about current research, new technologies, best practices and other stewardship activities to protect bees from unnecessary pesticide exposure. The discussion focused almost exclusively on agricultural pesticide use, especially dust in agricultural planting operations in which pesticide-coated seeds are used.

In late April, the European Commission adopted a moratorium on the use of three neonicotinoid insecticides - clothianidin, imidacloprid, and thiamethoxam - in the 27 European Union countries. The restrictions, which go into effect on December 1, prohibit seed treatments, soil applications and foliar treatments on bee-attractive plants and cereals. Manufacturers of the products have since lodged legal challenges against the suspensions.

Soon after the European Commission approved the moratorium, USDA and EPA issued a report finding that multiple factors are contributing to the declining honeybee population, including parasites, poor nutrition, a lack of genetic diversity, and

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Buzz About continued

pesticides. The study did not find sufficient evidence to warrant a ban on neonicotinoid pesticides in the United States and instead identified the Varroa mite as "the single most detrimental pest of honeybees."

Until this summer, the bee health issue was almost completely agriculturally oriented with almost all of the discussion centered on how to better protect managed bee colonies. However, that changed one late June morning when an Oregon pesticide applicator used a dinotefuran product to treat 55 linden trees encircling a suburban Portland shopping center for black vine weevils and aphids, an application that killed up to 59,000 bumblebees and other pollinators.

Almost immediately afterward the Oregon Department of Agriculture suspended for 180 days (from June 27-December 24) the use of 18 dinotefuran products labeled for applications on landscape trees and shrubs, nursery and greenhouse plans, turfgrass, forests and agricultural crops.

Media reports about the Oregon incident characterized the treatment as a "misapplication." Yet, the label language in question states that the product should not be applied or allowed to drift to blooming crops or weeds if bees are visiting the treatment area. The application was performed very early in the day, before bees were active. So the question authorities and perhaps a judge must answer: are linden trees in a parking lot a crop or weed?

The Oregon incident precipitated a late July letter from EPA to all of the registrants of products containing imidacloprid, dinotefuran, clothianidin and thiamethoxam directing the submission of additional information about their products. The bee kill also triggered the introduction of legislation in the U.S. House of Representatives suspending the use of several neonicotinoid pesticides. Although introduced by liberal Democratic Congressmen John Conyers (D-MI) and Earl Blumenauer (D-OR), by late September the Save America's Pollinators Act had attracted the support of almost 30 fellow House members including a conservative Tennessee Republican.

Additionally, a draft report accompanying legislation funding EPA's operations for Fiscal Year 2014 directs EPAto adopt a comprehensive assessment process that considers the risk of pesticides to honey bees, bumble bees, and solitary bees in all life stages and encourages the Agency take appropriate regulatory action to protect bees from pesticides.

In other state level activity, the New Jersey Legislature is considering a measure that bans the use, sale, offer for sale or promotional purposes, or distribution of any neonicotinoid pesticide. The General Assembly of Puerto Rico is considering similar legislation. The Vermont Legislature previously debated such a bill. In July, the Washington Department of Agriculture rejected a request from Thurston County commissioners - acting at the behest of the Olympia Beekeeper's Association - to ban homeowners from purchasing neonicotinoid pesticides.

In mid September, Health Canada's Pest Management Regulatory Agency announced protective measures it plans to implement before the 2014 growing season. Since few neonicotinoid pesticides are registered for PMP uses in Canada the recent announcement won't have much immediate impact on Canadian PMPs, although the recent action probably decreases the likelihood of the registration of neonicotinoid products for perimeter treatments in the foreseen future.

Activist groups have termed the recent decline in bee health "a second Silent Spring" and have lobbied officials from President Obama to Members of Congress to EPA officials about the issue. The groups have sued EPA in federal district court alleging that the Agency failed to adequately protect pollinators from neonicotinoid pesticides and are also urging big box retailers to stop selling neonicotinoid pesticides.

NPMA ENGAGEMENT

Since late June, NPMA staff has been deeply engaged in the bee health issue and has taken a number of steps to raise awareness of the issue within the professional pest management industry while also working with federal and state regulatory officials to educate them about the importance of retaining key PMP use patterns. Specific actions include:

- Meeting with senior EPA officials in early August to provide them with information on important PMP uses and suggestions for label language that is both protective of bees, while allowing critical PMP uses to continue,
- Sending a stewardship email out to all NPMA members,
- Scheduling a webinar/conference call with the NPMA government affairs and technical committees and PPMA scientific advisory group for early September to further discuss the issue,
- Partnering with the Association of

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Buzz About continued

State Pest Control Regulatory Officials to plan and co-host an October educational workshop for EPA employees that highlight PMP use patterns that target bees that threaten human health and property, and

- Working with ASPCRO and the American Association of Pesticide Control Officials to clarify the intent of the recent label revisions.

TAKE HOME MESSAGE

So what is the meaning of all of the efforts to limit unintended exposure to bees for PMPs. Below are a few take home messages:

1. The bee health issue is not a short-term issue and EPA's recent label changes should be viewed as the first of what will likely be multiple steps to safeguard bees from pesticide exposure.
2. Regulatory action will eventually extend to non-neonicotinoid pesticides as well. In fact, in mid-July, the European Commission voted to restrict the use of fipronil. Expect the label language that will appear on neonicotinoid product labels early next year to eventually appear on other products as well.
3. The public is deeply interested and concerned about pollinator health, so the story is likely to continue to receive widespread media coverage. Pesticides role in declining bee health was the subject of an August 19 Time Magazine cover story.
4. Regardless of whether PMPs are using neonicotinoids or other pesticide products, they should avoid unnecessarily exposing bees to pesticides, unless bees are the intended target for structural or public health reasons.

This article is provided as a member service for National Pest Management Association members. For more information or questions about the stories in this article, contact Gene Harrington or Marcia Duke or visit the NPMA Web site.

INDUSTRY NEWS

BASF Pest Control Solutions
July 2013 News Digest

Preventing Resistance to Bait Products ~ *PCTonline.com (Pest Control Technology)*
By Ameya D. Gondhalekar and Michael E. Scharf
Information on the effective use of cockroach baits and advice on achieving long-term success in cockroach management programs from researchers at Purdue University.

Despite the emergence of new active ingredients (AIs) and control technologies in the last decade, insecticide resistance remains one of the biggest challenges to effective cockroach control. This article revisits the now 60-year-old topic of cockroach resistance. It provides information on effective use of cockroach baits and advice on achieving long-term success in cockroach management programs while, at the same time, maintaining long-term product efficacy.

German Cockroaches as Pests.
Perhaps the main reason German cockroaches have become such important urban pests is their high reproductive potential. For example, German cockroaches have (on average) a three-month life cycle, females produce multiple egg cases in their lifetime from a single mating and there are 35 to 45 offspring produced per egg case.

German cockroaches are both aesthetic and health pests. Their mere presence and odors are enough to make us want to eradicate them, but on top of this, German cockroaches carry food-borne bacteria, and they produce at least six significant human allergens. With regard to allergies, we now know that German cockroaches are the leading cause of asthma among inner-city children in the United States (Gruchalla et al. 2005).

When considering these biological and human factors together (i.e., reproductive potential and pest status), it is no surprise that insecticides have been heavily used for cockroach management/control. As a result, cockroaches have developed resistance to nearly every insecticide and product targeted to them since the 1950s.

The Switch to Baits.
The federal Food Quality Protection Act (FQPA) was signed into law in 1996 and slowly took effect over the next several years. Some of the main provisions of FQPA included cancellation of most cholinesterase inhibitor pesticides, elimination of indoor broadcast applications, redefinition of "harm" as caused by pesticides to even molecular-level effects, and generally, increased emphasis on protecting children from pesticide exposure. Aside from the benefits of the FQPA, some of its long-term consequences have included the industry's move to gel baits as a primary means for controlling cockroaches, and (allegedly) the resurgence of bed bugs because of the elimination of indoor broadcast applications (another story entirely!).

Gel baits have proven to be effective for the professional pest management industry since their large-scale use began in the late 1990s. Some positive aspects of gel baits include highly controlled and cost-effective deployment, new "low impact" AIs, highly palatable formulations, compatibility with IPM programs and horizontal transfer to other cockroaches leading to effects known as secondary and tertiary kill (Buczkowski et al. 2008).

Regarding IPM, gel baits can be effective when used in combination with a holistic IPM program (see box above), but what about when gel bait applications fail? When should we expect resistance to be the cause? Because cockroaches typically consume large amounts of gel baits (and thereby insecticide), baits have been thought to have a reduced resistance risk; however, decades of research have taught us that no pesticides are immune from resistance.

What Is Resistance?
What is resistance? Our working definition of resistance is: control failures that result from physiological and behavioral adaptations in cockroaches after exposure to insecticides in earlier generations.

In general, pesticide resistance develops following Darwinian evolutionary principles, meaning that it is "pre-adaptive" (resulting from natural mutations that are not caused by pesticides) and "selectable" (builds over time in response to removing non-resistant individuals from the population). In cockroaches, since there is widespread resistance to all but two or three AIs ever used, we can safely conclude resistance is probably an inevitable consequence of all insecticidal pest management. In fact, some data suggests that once low-level resistance is detectable in a cockroach population, it can progress to problem levels in as little as one generation (Scharf et al. 1998).

In terms of contact insecticides, some older materials and their year of first documented resistance in German

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INDUSTRY NEWS continued

cockroaches are as follows: chlordane (1953), pyrethrins (1956), DDT (1959), chlorpyrifos (1980), bendiocarb (1987) and cypermethrin (1998).

Regarding bait actives, isolated cases of low-level resistance have been reported to fipronil (2003) and abamectin (2004). A recent case study of fipronil susceptibility in the "GNV-R" field strain from Gainesville, Fla., identified 35x resistance to fipronil by enzymatic and nerve-insensitivity mechanisms, which is the highest level of fipronil resistance yet reported in the refereed scientific literature (Gondhalekar & Scharf 2012). Interestingly, this strain also had resistance levels more than 100x to DDT and cyclodienes, more than 70x to pyrethroids, 25x to organophosphates and 13x to carbamates, but only 5x resistance to another bait active, indoxacarb. It is important to note, however, that the GNV-R strain remained susceptible to a fipronil bait product containing a higher concentration of AI.

Resistance Monitoring Studies. Presently, a major bait product in use in the global pest control market is Syngenta Professional Products' Advion gel bait containing the AI indoxacarb, which was introduced commercially in 2006. Our research program on indoxacarb began with the development of susceptibility monitoring bioassays that used lower concentrations of AI than appeared in commercial products (Gondhalekar et al. 2011). This strategy allowed us to see resistance development in its earliest stages — something never before accomplished in the history of chemical cockroach control.

As a next step, we collected 13 cockroach populations from across the United States and tested them in the monitoring program using both feeding and surface-contact bioassays (Gondhalekar et al. 2013). We found that most populations remained susceptible to Advion bait, but we did find one potential problem strain from North Carolina, and another from Cocoa Beach, Fla., that increased its tolerance levels by 2x with one year of exposure to indoxacarb and fipronil baits.

Despite showing the potential for resistance development, all strains tested remained susceptible to formulated product. Also, although a recent study reported on the sensory mechanism involved in glucose aversion-based bait resistance (Wada-Katsumata et al. 2013), our studies have yet to reveal any evidence of behavioral resistance to indoxacarb or fipronil baits. Glucose aversion has been known to exist for more than 20 years and manufacturers have acknowledged its presence and adjusted bait formulations accordingly for nearly as long (Silverman & Bieman 1993; Wang et al. 2004). More importantly, these research findings underscore the need for routine use of resistance management practices in all cockroach management programs, as well as emphasize the need for effective, science-based resistance management programs.

Resistance Management

Three general strategies are applicable for resistance management in cockroaches and other urban pests: (1) insecticide rotations, (2) insecticide mixtures and (3) non-chemical IPM. For rotation-based resistance management, insecticide products and formulations are used in sequence, on a generational basis. For German cockroaches the average generation time is three months, thus, we recommend (1) rotating AIs every three months and (2) rotating through at least three AIs before returning to the original. In this case, the term "AI" is used rather than "product" because in some cases the same AIs exist in different products or formulations, such as baits and sprays. Ongoing research may result in eventual modification to this recommendation,

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but the "three-month/three-AI" strategy is the most well-developed strategy available at the present time (Scharf et al. 1998; Gondhalekar et al. 2013).

Although more research is needed to better define rotation parameters especially for bait products, rotations are recognized as the most viable resistance management option by the Insecticide Resistance Action Committee (IRAC). IRAC is a consortium of insecticide manufacturers with a vested interest in product preservation and stewardship. The IRAC web site (www.irac-online.org) provides mode of action classification information that is updated annually to assist pest managers in choosing AIs for use in rotations. Other useful information on insecticide classifications and mode of action can be found in an earlier PCT article (Scharf & Suiter 2011).

Mixture-based resistance management involves the use of two insecticide AIs concurrently. For mixtures to be effective and not cause greater resistance problems, both AIs have to be equally persistent and no cross-resistance can exist between them. It is for these two reasons primarily that the mixture strategy is not considered compatible with baiting.

The only viable mixture options for cockroach control are (1) newer spray products that combine two AIs (e.g., nicotinoids + pyrethroids; Syngenta's Tandem, FMC Corp.'s Transport, Bayer Environmental Science's Temprid) or (2) mixtures of conventional insecticides (pyrethroids) and synergist products that contain PBO or MGK-264, etc. Synergists are essentially non-toxic on their own, but when combined with insecticides, will block insect detoxification and increase the contact insecticide's potency. Conversely, mixing two different products or formulations with the same AI would be considered disadvantageous (e.g., Advion and Syngenta's Arilon, or **BASF's Alpine spray and bait**), since this would only increase resistance to the AI if it already existed.

Finally, IPM and other non-chemical pest management approaches can be excellent strategies for resistance management. These non-chemical approaches may not work well as stand-alone techniques, but there is no question they make conventional insecticides and baits more effective. First and foremost is sanitation, which limits food and moisture that compete with baits and reduces clutter and harborage, making baits more accessible to cockroaches.

Exclusion is effective for preventing new cockroaches from entering an account and keeping them from accessing resources in adjoining locations. Trapping and vacuuming carry additional costs (particularly vacuuming in terms of time), but these two techniques can be very effective for physically removing cockroaches from an account. Likewise, heat can be a costly approach, but with the growing availability of heating equipment for bed bug control, this is certainly another cockroach IPM tool for PMPs to consider. Finally, client communication or "Integrated People Management" underlies all successful, long-term cockroach control programs. Teaching clients and occupants how to identify and prevent conducive conditions for cockroaches will pay big dividends when it comes to maximizing the efficacy of chemical control.

Conclusion.

In summary, insecticide resistance is a heritable, evolutionary phenomenon that can progress towards problem levels in as little as a single generation. Resistance can be caused by physiological factors, where pests develop biochemical mechanisms that allow them to tolerate insecticides

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(most common), or behavioral changes, where pests can better detect components of insecticide baits or sprays and thus avoid AIs (less common and does not involve "learning").

Insecticide resistance in German cockroaches was first noted more than 50 years ago and, despite having new AIs and delivery methods, it persists through the present day. Unfortunately, resistance does not evolve the same way in every situation for every insecticide, and thus it is extremely difficult to predict the effective market life for any product. For this reason, resistance monitoring programs are of key importance. In this case, resistance monitoring can involve sending field-collected strains to consultants or university researchers for testing, or it can be done by PMPs themselves by holding collected cockroaches directly with gel baits — any survival past 72 hours is a strong indicator that resistance is present.

Also, importantly, we recommend that PMPs make some kind of resistance management practice mandatory in their regular business operations (especially rotation and non-chemical IPM). The integrated use of product/AI rotations and non-chemical pest management is the best option available for resistance prevention and management. Many resources are available for developing your own custom resistance management programs, including the refereed scientific literature, industry consultants, academic scientists and IRAC Internet resources available at www.irac-online.org.

Authors' note: We thank Gary Bennett and Grzesiek Buczkowski for helpful feedback, and acknowledge DuPont, Syngenta and the O.W. Rollins/Orkin Endowment at Purdue University for research support.

OSHA Hazard Communication Standard

US Hazard Communication Standard Training on OSHA Label and SDS Updates
NPMA Online Training Now Available!

In 2012, the US Hazard Communication Standard (HCS) was revised to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Specific changes to the HCS to align US chemical hazard communication with the world standards include:

- New Label requirements for (non-pesticide) chemical labels
- A change from Material Safety Data Sheet (MSDS) to Safety Data Sheet (SDS)
- A new, 16-section standard format for Safety Data Sheets (SDS)

OSHA has set a training deadline for being familiar with these new components by December 1, 2013. To ensure completing this requirement is easy for you and your staff, log-on to the NPMA Online Learning Center and take the HCS Training Course. This interactive module will provide learners with the updated information about Revised Hazard Communication Standard training required by OSHA to be completed by the December deadline. The course will take approximately 30 minutes to complete, plus additional time to finish the quiz. In the course you will learn about:

- Why the Hazard Communication Standard (HCS) was updated
- What changed because of the update, including the global harmonization of chemical labels and Safety Data Sheets
- How changes to chemical labels and SDS will impact pest management professionals

NPMA News

Federal Government Shutdown Impacts EPA Operations

The federal government shutdown has forced the activities of the U.S. Environmental Protection Agency's Office of Pesticide Program (OPP) to a grinding halt. Overall, about 94% of the EPA's 16,205 employees have been sent home for the shutdown, including the entire OPP staff with the exception of the Program's Director, Dr Steve Bradbury.

Depending on the length of the shutdown, it will significantly impact product registrations, ranging from new active ingredients to the approval of additional use patterns for currently registered products. The shutdown could also delay the addition of the recently approved bee protection language to certain neonicotinoid pesticide product labels. EPA had hoped to have that language on product labels by early next year. Unlike many other federal agencies, EPA's website is still operational.

NPMA Technical Update: Honeybee Foraging Interference?

A recently published paper in the journal Nature reported that diesel exhaust pollution may interfere with honeybee function. Honeybees rely on floral odors when foraging and obstruction or masking of floral odors hinders the ability of a honeybee to forage effectively. Scientists from the University of Southampton in the United Kingdom prepared a synthetic blend of floral chemicals and then exposed it to diesel exhaust pollution. The diesel exhaust degraded 4/8 floral compounds within one minute, changing the detectable nature of the synthetic floral blend to honeybees. Environmentally relevant levels of one component of diesel exhaust, mono-nitrogen oxide, was especially capable of degrading floral odors used by honeybees. Honeybees and other pollinators are incredibly important agriculturally and maintaining honeybee health is of utmost importance.

The original article, written by Robbie D. Girling et al. (2013)

North Carolina Exploring Canine Detection Team Rulemaking

The N.C. Structural Pest Control Committee recently requested the North Carolina Department of Agriculture and Consumer Service's Structural Pest Control and Pesticide Division work with the N.C. Attorney General's office to develop draft rules for the panel to consider concerning training, certification and supervision of canine pest detection businesses. Earlier this year, Maryland became the first state to adopt rulemaking specific to canine pest detection teams (handler and dog).

West Nile Virus Update

West Nile virus is an arthropod-borne virus (arbovirus) most commonly transmitted by the bite of an infected mosquito. Since the first North American detection of West Nile virus in 1999, several mosquitoes have been found to harbor the virus, including *Aedes, Anopheles, Culex*, and several other mosquito genera. West Nile virus can cause febrile illness, encephalitis or meningitis, however, 70-80% of people infected with West Nile virus are asymptomatic.

According to the latest update by the Centers for Disease Control and Prevention (CDC), 48 states and the District of Columbia have reported West Nile virus in people, mosquitoes, or birds. 1,135 people have been diagnosed with West Nile virus infections so far in 2013, and 44 of those people have died. The states of California, Colorado and South Dakota have experienced the highest number of infections, cumulatively accounting for over forty percent of the nationwide total. Peak season is from June to September, correlated with mosquito activity.

7A & 7B Technician Training Available from MPMA

The **revised Missouri Pesticide Technician Training is Categories 7a and 7b**, General Structural and Termite Pest Control programs have been approved by the Missouri Department of Agriculture and are now available from Missouri Pest Management Association. ***Please note - The Department of Agriculture will soon stop approving the old technician training programs from MPMA. If you have been using those programs, place your order today for the updated programs while there is time to get approval before you train a new technician.***

Member Price		Non Member Price	
7a	$75.00	7a	$150.00
7b	$75.00	7b	$150.00
Both Categories	$125.00	Both Categories	$250.00

Remember...new technician trainees must complete 7a and 7b training before applying for license from the Department of Agriculture. Call MPMA for your copies today...573-761-5771 or 800-848-6722.

Missouri Pest Management Association
Greater St. Louis Pest Control Association

Annual Conference and Exposition

Hilton St. Louis Frontenac
St. Louis, MO
November 19-21, 2013

AGENDA

Tuesday, November 19, 2013

5:00 pm	Exhibitor Set up
7:00 pm	Reception with Exhibitors

Wednesday, November 20, 2013

7:00 - 8:00 am	Registration and Continental Breakfast with Exhibitors
8:00 - 9:00 am	**Measuring Up/Key Business Indicators** *Speaker: Mike Rottler*
9:00 - 10:00 am	**Healthcare Update/Insurance** *Speaker: Mike Messer*
10:00 - 11:00	**Bed Bug Heat Treatments and Sprinkler Systems** *Speaker: Jim Fredericks, NPMA*
11:00 am	Vender Update in Exhibit Hall
12:00 noon	Awards Luncheon with Exhibitors
1:00 - 2:00 pm	**Flea Biology Behavior and Treatment Methods** *Speaker: Jim Fredericks, NPMA*
2:15 - 3:00 pm	**US Hazard Communication Standard** *Training requirements for the revised Hazard Communication Standard Compliance Deadline is December 1, 2013*
3:00 - 5:00 pm	**Roundtable/Panel on Pest Control Best Practices** *Moderator: Mike Rottler* *Panelist: Large Firm, Gunter Pest; Small Firm, SEMO Termite and Pest; Lawn and Garden, Atkins; Jeff Archer, Critter Control; National Chain, John Flores, Home Team Pest Defense, St. Louis*

ACE TRAINING
Wednesday, November 20

8:30 am	Registration
9:00 am	ACE Training
12:00 noon	Lunch
1:00 pm	ACE Testing

5:00 pm	Adjourn
5:00 pm	Missouri Pest Management Association Annual Meeting

Thursday, November 21, 2013

7:00 am	Registration and Continental Breakfast with Exhibitors
8:00 - 9:00 am	**Safety and Equipment Maintenance** *Speaker: Tommy Reeves, Oldham Chemicals*
9:00 - 10:00 am	**Wood Destroying Insects** *Speaker: Dr. Richard Houseman*
10:00 - 10:30 am	Break
10:30 - 11:00 am	**Wood Destroying Insects continued** *Speaker: Dr. Richard Houseman*
11:00 - 12:00 noon	**Rodents** *Speaker: Clay Scherer, Syngenta*
12:00 noon	Luncheon
1:00 - 2:00 pm	**Ants (Perimeter Ant Control and Options)** *Speaker: Clay Scherer, Syngenta*
2:00 - 3:00 pm	**Chemical Labels** *Speaker: Loren Cunnington, Zoecon*
3:00 - 4:00 pm	**Growth Regulators/What are the benefits** *Speaker: Loren Cunnington, Zeocon*
4:00 - 5:00 pm	**Fly Biology and Control with Vector Lights** *Speaker: Steve Jackson, P & L Systems*
5:00 - 5:30 pm	Department of Agriculture *Speaker: TBA*

ACE Application Process

Log on to www.entocert.org/ace-application-process. Complete the ACE Application. All certification applications must be received at least 30 days prior to the desired test date. Contact for the application is www.entocert.org/ace-prep-course.

Instructor: Jeffery Preece, BCE

Hilton St. Louis Frontenac
1335 S. Lindbergh Blvd.
St. Louis, MO 63131

Single or Double Accommodations $95.00
Cut off date for reservations is 10/29/13

For Reservations call 800-325-7800, reference Missouri Pest Management Association for group rate.

DIRECTIONS

From Kansas City, Missouri take I-70 E 207.0 miles, merge onto I-64 E/US-40 E/US-61 S via exit 210A toward Chesterfield and go 28.0 miles, merge onto Lindbergh Blvd./US-67 S/US-61 S via exit 28A. Hilton St. Louis Frontenac, 1335 S. Lindbergh Blvd. will be on the right. From Springfield, Illinois take I-55 S 92.5 miles crossing into Missouri, stay straight to go onto I-64 W/US-40 W 11.9 miles; take US-61 S/US-67 S exit 28A and make a slight left onto US-67 S/US-61 S/Lindbergh Blvd. Hilton St. Louis Frontenac will be on the right.

AMENITIES

Bar/Lounge
Business Center
Free Parking
24-Hour Fitness Center
Sauna
Free Wi-Fi

HOTEL DINING ACCOMODATIONS

Satisfy your appetite at the hotel's restaurant, which serves breakfast, lunch and dinner, or stay in and take advantage of room service (during limited hours). At the end of the day, relax with your favorite drink at the bar/lounge.

RE-CERTIFICATION CREDITS

Recertification credit hours have been approved from **Kansas Department of Agriculture** for the following on November 20, 2013: 2 hrs in 7E – Structural Pest Control; 2 hrs in 7D – Health-related; 2 hrs in 8 – Public Health. On Nov 21, 2013: Core Hour; 5 hrs in 7E – Structural Pest Control; 2.5 hrs in 7A – Wood-destroying; 2 hrs in 7D – Health-related; 2 hrs in 8 – Public Health.

Recertification credit hours have been approved from **Missouri Department of Agriculture**.

This program has been approved for 9 hours of recertification credit from **Illinois Department of Public Health** under the provisions of the Structural Pest Control Act and Code.

Recertification credit hours have been approved from **Arkansas State Plant Board**.

REGISTRATION FORM

(please complete a registration form for each person attending)

Name: _____

Company: _____

Address: _____

City, State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

Note: Full registration fee includes conference handouts, all breaks, exhibit viewing, lunch each day, two continental breakfasts and Welcome Reception.

MEMBER FEE (MPMA or GSLPCA)	Before 11/ 15
ACE Training - Wednesday, November 20	❒ $75.00
Entire Conference	❒ $150.00
One Day - Wednesday, November 20	❒ $75.00
Wednesday Afternoon Only (includes lunch)	❒ $50.00
One Day - Thursday, November 21	❒ $75.00
Thursday Morning Only (includes lunch)	❒ $40.00
Thursday Afternoon Only	❒ $50.00
NON MEMBER FEES	
ACE Training - Wednesday, November 20	❒ $85.00
Entire Conference	❒ $175.00
One Day - Wednesday, November 20	❒ $100.00
Wednesday Afternoon Only (includes lunch)	❒ $60.00
One Day - Thursday, November 21	❒ $100.00
Thursday Morning Only (includes lunch)	❒ $50.00
Thursday Afternoon Only	❒ $60.00
Registrations received after November 15, please add 10% processing fee	$ _____
TOTAL AMOUNT	$ _____

METHOD OF PAYMENT

❒ Check enclosed ❒ Invoice my company ❒ Credit Card (MasterCard, Visa, Discover)

Card Number: _____ Expiration Date: _____

I am a Member of ❒ MPMA or ❒ GSLPCA

Mail Registration Form and Payment to: MPMA, PO Box 1463, Jefferson City, MO 65102, Fax: 573-635-7823 or email: missouripest@aol.com

NOTE: No Refunds will be given after November 15, 2013.

A Publication of the
Missouri Pest
Management Association

MPMA
722 East Capitol Avenue
PO Box 1463
Jefferson City, MO 65102

Phone: 573-761-5771 or
800-848-6722
Fax: 573-635-7823
missouripest@aol.com

2013-14 MEMBERSHIP/RENEWAL APPLICATION

Dues run July 1 through June 30. Please complete the information listed below, verify information with your signature and mail in the corresponding dues amount. Make check payable to MPMA and mail to: PO Box 1463, Jefferson City, MO 65102. If you have questions, call 573-761-5771 or 800-848-6722.

Company Name: _____

Company Representative: _____

Address: _____

City/State/Zip: _____

Phone: _____ Fax: _____

Email: _____

For Companies with Annual Sales Volume of…		Annual MPMA/NPMA Dues are…
❒	$0 - $100,000	$185
❒	$100,001 - $200,000	$235
❒	$200,001 - $500,000	$335
❒	$500,001 - $1,000,000	$645
❒	$1,000,001 - $2,500,000	$915

Allied, Affiliated, and Limited Members
❒ $125

Signature: _____ Date: _____

❒ **Active Members:** Any person, firm or corporation engaged in pest management service work, for hire to the public at large shall be eligible for membership in this Association.

❒ **Affiliated Members:** Any active member that operates or controls another firm, and/or business location actively engaged in the pest management service business.

❒ **Limited Members:** Any person, firm or corporation not fully conforming with qualifications for Active members. A limited member shall automatically become an Active member upon meeting the qualifications wet forth for Active Membership.

❒ **Allied Members:** Any person, firm or corporation not engaged in pest management service work but which manufactures or supplies products, equipment, materials or provides services used by the pest management industry shall be eligible for Allied membership.

❒ **Honorary Members:** Any person who has made a contribution of material benefit to the pest management industry may become an honorary member by three-fourth (3/4) vote of the members of the Association in annual meeting assembled.