FEDERATION OF ASIAN & OCEANIA PEST MANAGERS ASSOCIATIONS

NEWSLETTER

JANUARY 2019

FAOPMA
FEDERATION OF ASIAN & OCEANIA PEST MANAGERS ASSOCIATIONS
亞大區蟲害管理協會聯盟

Protecting the Lives and Homes of Over Four Billion People

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Cover: Mdm Huang Xiaoyun, President FAOPMA, presenting Mr. David Gay OAM, Past President AEPMA, with a thank you gift for his presentation at the 2018 FAOPMA-Pest Summit meeting in China (see Pages 12-15 for conference highlights).

A New Dawn Emerges!

Welcome to a New Year and the new look for the Federation of Asian & Oceania Pest Managers Associations Newsletter.

The Newsletter has been on hold since the sad passing of the former Editor, Mr. Doug Howick. A tribute to Doug appears in this edition written by two close colleagues.

The new look Newsletter is broken up into several sections. Firstly there is an introduction to the new Editors. Feature articles follow and expect many more in future editions. For this issue, a first-hand account is given of the successful eradication campaign to rid Lord Howe Island (a fragile ecosystem) of the African big-headed ant.

The section titled 'Icon' features industry leaders, both past and present. Few in the industry have been more successful then John Ho. John is the former owner of Aardwolf Pestkare in Singapore and he talks about his history in the industry and his decision to sell his business.

'Conferences' will review some of the major pest events from across the globe. In this edition, the highlights of last year's FAOPMA-Pest Summit are presented along with images of the event. **Look for the flyer for the next FAOPMA-Pest Summit (Page 11), which will be held in Daejon, Korea over 24-27 November 2019**. This is a must attend conference! Past events also featured include PestWorld 2018 (the largest pest related event) and the Global Bed Bug Summit (the biggest global event on bed bugs). To assist all FAOPMA members in running meetings, a procedural document has been produced. This is called '*FAOPMA Guidelines for the Hosting of Conferences and Events*' and will evolve over time.

Next are 'Book Reviews'. The first features my new text, *Advances in the Biology and Management of Modern Bed Bugs,* the first academic text on bed bugs for over 50 years. Also reviewed are *Guide to Venomous and Medical Important Invertebrates, Bedbug,* and *Urban Pest Control: A Practitioner's Guide*. In the future, expect to see reviews of some of the classical books from the past.

'News Items' highlights the latest happenings from the FAOPMA member associations. There are also pest management related items featured from the media and the latest from academia. Remember that research today, will be what you are doing operationally tomorrow.

There is an 'Events' page listing future conferences and a 'Name this Pest' feature. You may wish to identify the creature and the answer as to what it is and a fact sheet on this pest will be provided in the next issue.

Importantly, this Newsletter is for you and will only be made great if contributions are received from all FAOPMA members. Guidelines for submission are on page 3.

Finally, if you like this Newsletter, then let us know. Also tell us how it can be improved and what you would like to see in future editions. Feel free to express your opinion and write to the Editors. Editorial contacts are on Page 2.

Hopefully you will enjoy this new look Newsletter.

Stephen Doggett (Chief Editor)

Meet The New Editors

STEPHEN L. DOGGETT (CHIEF EDITOR)

Stephen Doggett is Director of Medical Entomology at Westmead Hospital in Sydney, Australia. He is well known in the pest industry for his contribu-tions to the field. He was awarded the inaugural *'Award for Excellence'* in 2012 for services to the Australian pest management industry. Stephen is the Chief Editor of *A Code of Practice for the Control of Bed Bugs in Australia* and *Advances in the Biology and Management of Modern Bed Bugs*, the latter being the first academic text on bed bugs for more than 50 years. He has also produced a number of books including *Do You Have Bed Bugs?* and *A Guide to the Mosquitoes of Australia*, the latter winning the prestigious Whitley Award. Stephen has produced more than 600 papers and presented over 420 lectures at various local and international conferences. He has researched and published on mosquitoes, ticks, bed bugs, bird mites, and a range of other public health pests, and is an internationally awarded insect photographer. Stephen serves on a number of local and international advisory boards, and is a subject editor for *Austral Entomology*.

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DAVID LILLY (ASSOCIATE EDITOR)

David Lilly is a Lead Entomologist for Ecolab's Global Pest Elimination – RD&E division based out of Sydney, Australia. He is responsible for provid-ing RD&E leadership and technical support to Ecolab's Asia Pacific and Greater China pest businesses. David completed his MSc and PhD at the University of Sydney researching insecticide resistance in bed bugs in Stephen's lab. David has been involved in the urban pest control field for over 15 years, including 13 with Ecolab. He has represented Ecolab on the working parties responsible for the development of *A Code of Practice for the Control of Bed Bug Infestations in Australia*, *A Code of Practice for Pest Management in the Food Industry*, and the HACCP Australia Pest Management Standard. David is Ecolab's global (international market) subject matter expert for mosquitoes, and has extensive experience with bed bugs, ants, large filth flies, cockroaches, stored product pests, insecticide selection, and insecticide resistance.

Email: david.lilly@ecolab.com ■

Wanted: an Associate Editor is required with experience in pest management business practices. If you wish to be part of this new and exciting Newsletter, send your resume to Stephen Doggett (Stephen.Doggett@health.nsw.gov.au)

New Story, New Research, New Product, New Event, New Ideas?

Then Why not Share all this New Stuff with the Rest of the World!

Contributions to the FAOPMA Newsletter are Welcome

AIMS AND SCOPE

The FAOPMA Newsletter is published quarterly and aims to provide highly quality and science based information pertaining to the pest management industry for FAOPMA members.

Submissions must be relevant to the regions covering FAOPMA members (see www.faopma.com for a list of associations and the respective countries they serve). Submissions may include: original articles based on new research; new products; new events; conference reviews; news items; opinion pieces; stories on industry icons; tributes to past colleagues; book reviews; general articles on pests, pest science, or pest management; and articles relevant to new laws, regulations or other legal issues pertaining to the pest management industry. **Advertorials offend and will not be accepted; *our members crave real science*!**

CONTRIBUTION GUIDELINES

Contributions are to be in Microsoft Word. DO NOT EMBED IMAGES, send as separate files (see below). For conference flyers and announcements, Adobe PDF format is acceptable.

CONTRIBUTION FORMAT

Title (3-10 words): provide a succinct but eye catching title.

Summary: provide a short summary of the submission in no more than 20 words

Authors: list authors by First name, Surname, include middle name/s as initials. Please also include title, affiliation and email if you wish to be contacted. The affiliations will appear at the end of the formatted submission.

Body of text: 600-1,500 words. Please include subheadings. Large articles may be considered at the discretion of the Editors.

Tables: if possible, avoid using tables.

References: no more than 10.

Images and Figures: (*as noted above, do not embed in Word files*). Images are to be full colour and jpg format. If the file size is more than 5MB, then compress the image (i.e. decrease image quality in a photo editor such as Photoshop). Please send several images, but usage of the images will be dependent on publication space. Include a short caption describing the images/figures.

Copyright: it will be assumed that you own the copyright of the information and images submitted, or have written permissions to use these**. Failure to adhere to international copyright laws is your responsibility**. The Editors will only use your information and images for the submitted article, unless otherwise requested. However, articles may reappear online, in print, or in other media. They may be translated and then reprinted in the respective FAOPMA member newsletters.

Acknowledgments: include any potential conflict of interests and sources of funding (if relevant). If acknowledging colleagues, include their full name, position, company or employer, city and country.

Language: English. Write in plain language and avoid complex scientific terms. Avoid dot points and use correct grammar (send to a professional editing service if in doubt).

Galley Proofs: for articles and larger manuscripts (of more than one page) a galley proof of the typeset article will be sent to authors for review. Please annotate the PDF and return to the editors within 48 hours. A nil response will be seen as acceptance of the manuscript.

Review: if the Editors are in doubt about the quality of a submission, then the manuscript may be sent for external peer review. Such reviewers will remain anonymous to the authors.

Access and Sharing: authors are permitted to make their paper available on any platform, such as ResearchGate.

Submissions will be published at the discretion of the Editors.

Editorial email contacts are listed on Page 2. ■

FEATURE

How we Wiped out the Invasive African Big-Headed Ant from Lord Howe Island

A First-Hand Account of the Eradication of an Exotic Ant Species

Ben Hoffman

The invasive African big-headed ant (*Pheidole megacephala*) was found on Lord Howe Island in 2003 following complaints from residents about large numbers of ants in buildings.

But we've managed to eradicate the ant completely from the island using a targeted mapping and baiting technique than can be used against other invasive species.

Up to 15% of Lord Howe Island was thought to be infested with the ant.

The African big-headed ant, author supplied image

A MAJOR PEST

The African big-headed ant is one of the world's worst invasive species because of its ability to displace some native plants and wildlife, and adversely affect agricultural production.

"the African big-headed ant is one of the world's worst invasive species because of its ability to displace...

It's also a serious domestic nuisance. People can become overwhelmed by the large number of ants living in their buildings – you can't leave a bit of food lying around, especially pet food, or it will be covered in ants.

It remains unclear how long the ant had been on Lord Howe Island, in the Tasman Sea about 770 km northeast of Sydney, before being found. But it is likely to have been present for at least a decade.

Because of the significant threat this ant posed to the conservation integrity of the island, an eradication program was started. But on-ground work done from 2003 to 2011 had many failings and was not working.

Lord Howe Island, author supplied image

In 2011, I was brought in to oversee the program. The last ant colony was killed in 2016, but it is only now, two years later, that we are declaring Lord Howe Island free from the ants.

A SUPER COLONY

The ability to eradicate this ant is largely due to its relatively unique social organisation. The queens don't fly to new locations to start new nests – instead, they form interconnected colonies that can extend over large areas.

This makes the ant's distribution easy to map and treat. The ant requires human assistance for long-distance transport, so the ant will only be found in predictable locations where it can be accidentally transported by people.

From 2012 to 2015, all locations on the island where the ant was likely to be present were formally inspected. Priority was given to places where an infestation was previously recorded or considered likely. The populations were mapped, and then treated using a granular bait available at shops.

In the latter years we found 16 populations covering 30 hectares. Limited by poor mapping in the early years, we estimate that the ant originally covered up to 55 hectares, roughly 15% of the island.

STOPPING THE SPREAD

The widespread distribution of the ant through the populated area of the island is thought to have been aided by the movement of infested mulch and other materials from the island's Waste Management Facility.

To prevent any more spread of the ant, movement restrictions were imposed in 2003 on the collection of green waste, building materials and other high risk items from the facility.

The baiting program used a product that contains a very low dose of insecticide that has an extremely low toxicity to terrestrial vertebrates such as pet cats and dogs, birds, lizard etc. The toxicant rapidly breaks down into harmless chemicals after exposure to light.

No negative impacts were recorded on any of the native wildlife on the island.

Importantly, the African ant usually kills most other ants and other invertebrates where it is present, so there are few invertebrates present to be affected by the bait.

Ecological recovery of the infested areas was rapid following baiting and the eradication of the African ant.

ANOTHER ANT INVADER

One of the main challenges was getting the ground crew to correctly identify the ant.

It turns out there was a second (un-named) big-headed ant species present, also not native to the island, that created a lot of unnecessary work being conducted where the African ant wasn't present.

Like numerous other exotic ant species present, this second species was of no environmental or social concern, so there are no plans to manage or eradicate it.

The protocols used in this program are essentially the same that are being used in other eradication programs against Electric ant in Cairns and Browsing ant in Darwin and Perth, because those two species also create supercolonies.

It is highly likely that those programs will also achieve eradication of their respective species, the first instance where an ant species has been eradicated entirely from Australia.

The fire ant program in Brisbane has many similarities, but there are distinct differences in that the ants there don't form supercolonies that are so easy to map, and the area involved is far greater. ■

Ben Hoffman is the Principal Research Scientist, Commonwealth Scientific and Industrial Research Organization (CSIRO) in Darwin, Northern Territory, Australia.

This article first appeared in the Conversation and reprinted under Creative Commons licence:
http://theconversation.com/how-we-wiped-out-the-invasive-african-big-headed-ant-from-lord-howe-island-106447

Charles Douglas Howick

In Memorium, 1935-2018 (83 years)

Jim Bowden and Ion Staunton

The Doug Howick era in wood protection is over. What an expansive and positive era it was. He has provided a solid base for the next era.

Charles Douglas Howick passed away in Melbourne on the 1st of June 2018 after a short illness. His loved and loving wife Sigrid was by his side.

Departing from his usual style of formality, he had stipulated there be no memorial service but a private cremation followed by a Wake when friends could gather and tell of their recollections. It wasn't formal, but it was proper — as he'd have expected.

Life started for Doug Howick at Twickenham, London, on April 9, 1935.

After his early education he joined the Merchant Navy serving as an radio operator with the Shaw Saville Line on the MV Romanic. His travels took him to many ports and eventually he chose to "go ashore" in Melbourne. Brighton, a bayside suburb, became his home for the rest of his 83 years.

His first step into wood protection was taken in 1961; he joined the CSIRO Division of Forest products in Melbourne as a Technical Officer and Experimental Scientist, retiring some 31 years later as Assistant to the Chief of the Division as a Senior Specialist.

His research focused on termite and other insect studies and the management of a variety of projects in wood protection, but also importantly, industry interactions, networking and technology transfer. His emphasis on these last three were the reasons he became one of the best known persons in the world of wood protection.

Doug's many positions on industry bodies included national secretary of the J.W. Gottstein Trust (1984-87) and Secretary-Treasurer to the formation committee of the National Association of Forest Industries (1986-87).

Already making an impression and being noticed in CSIRO as someone with potential, in 1967 he was awarded one of the early Australian Churchill Fellowships, for a ten-month world study tour, *"An international study of the incidence, distribution and economic significance of certain wood-destroying insects having the potential ability to establish in Australia"*.

For the most of 1968, he met and worked alongside most of the international gurus in that field in USA, UK, Europe and South and East Africa. He returned to his Division to find that many of those international experts had communicated commendatory remarks about his abilities to the CSIRO management. The Organisation listened to and accepted his recommendations to expand its research and experimental entomological endeavours.

> *"he was so helpful and an inspiration to me as a young timber technician"*

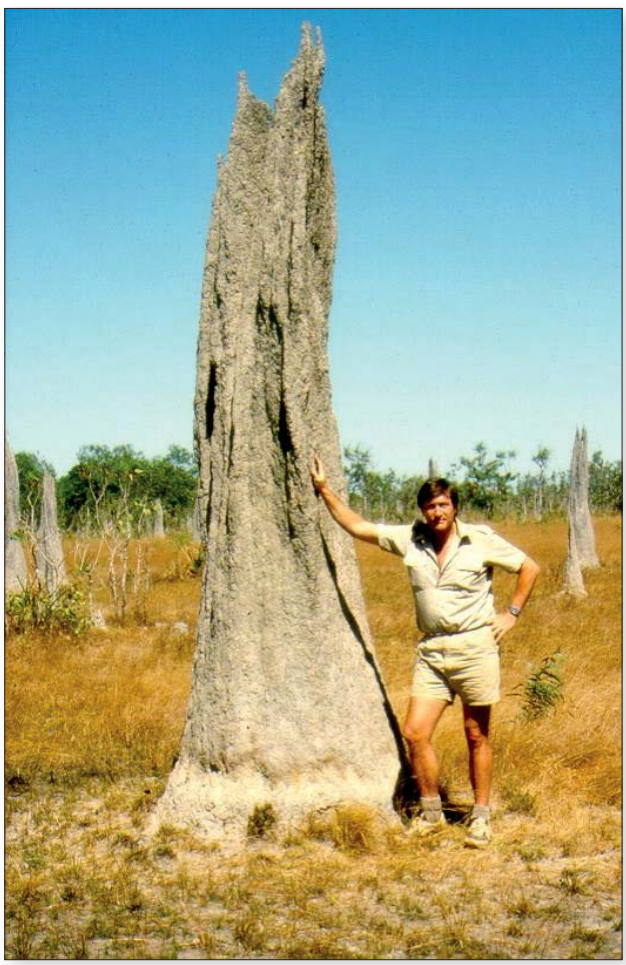
Doug was author of more than 60 scientific papers on forest products entomology, wood technology, and pest management, as well as a further 50 reports, conference papers and presentations. He retired from CSIRO in 1992, aged 57. He was far too young, had too much knowledge, too many contacts and therefore involvement with so many organisations to actually retire — so he didn't.

He was offered the position of the National Secretary of the Timber Preservers Association of Australia (TPAA) which he held for 20 years, and during that time he also served as the National Executive Director of the Australian Environmental Pest Managers Association (AEPMA) for 10

years. His drive in both organisations saw an increase in membership and involvement with government and like-minded organisations — and he was honoured by both with Life Memberships. The deepening ties between the AEPMA and the Federation of Asian and Oceania Pest Managers Associations (FAOPMA) led to Doug being given the title of Honorary Advisor to FAOPMA. Then he "retired". He was only 71, he was still healthy and he wanted to continue being useful.

His Advisory role within FAOPMA, meant attending the conferences with Sigrid and, to fill in "spare" time, he edited and produced their bi-monthly Newsletter "PPM News", and continuing his involvement with TPAA, did the same with the "CONTACT" newsletter.

For most of all this time, Doug was also a member of the timber industry service club: the Hoo Hoo Club. He became the Jurisdiction IV President, 1983-84, and also wore the mantle of Hoo Hoo Historian. He was the driver of the Hoo-Hoo International Convention in Melbourne in 1982 which attracted the biggest delegation of US and Canadian industry representatives ever assembled Down Under. He earned his Life membership there as well.



A young Doug next to a termite mound in the Northern Territory

Then he did something for himself.

Doug had authored many scientific papers but he thought he might have something else to say — to write a book on the history of termite research in Australia. He phoned Ion Staunton and asked about his historical-flavoured *Preface: in the beginning,* in the book *Urban Pest Management in Australia.* After an overnight think, Doug phoned Ion again and asked if he would be his co-author. He felt that between them, the threads of scientific developments could be entwined with the threads of commercial stories.

Doug had a cavernous vault of meticulously recorded facts about anything pertaining to wood, particularly termites, including many hard copies — real paper scientific papers — in two steel cabinets beside his desk. Over 600 of these are listed in three Appendices. The book as planned, morphed into something bigger during the writing and the word "concatenated" from the Hoo Hoo influence was inserted into the title which was published in October 2017 as *Colonies in Collision: a concatenated chronicle of termites and termiteers in Australia 1788-2018.* (Doug really liked alliteration).

During the co-writing years they referred to it as "the CTB" (coffee table book) and, printed in Australia on good quality "paper from trees not eaten by termites" and weighing 1.5 kg, it will hold down any coffee table. It was favourably reviewed and buyers usually comment on how delightfully readable it is. It was Doug's last big effort — apart from always being on-time or a day-early with the bi-monthly newsletters. Mr Dependable.

The Wake was a wonderful tribute to Doug, Sigrid, and their family. Attendees from WA, SA, NT, QLD, NSW, and Victoria spent a few hours reminiscing on Doug-stories rather than his achievements.

"I thought he would live forever; he was so helpful and an inspiration to me as a young timber technician."

"I thought he was indestructible."

"Sad news. A mate gone too soon."

"Doug had the rare combination of being both a gentleman and a character. His knowledge of the industry was immense."

"How dreadfully sad! That is one very important pillar of our industry gone that will not, cannot, be replaced."

"Doug always seemed above mere mortality to me."

"I am deeply saddened... Doug was an old friend of FAOPMA and his contributions to the industry are beyond what any words can describe" — Ms Huang Xiaoyun, President.

"Doug's presence, integrity and humour are but three of so many words that fit – and which he wore quite comfortably".

Many speakers began with the words: "I first met Doug in..." That told us that meeting Doug Howick was a significant milestone in the life of so many.

"He was many things... all good, but I think his way with words and use of puns was endearing".

An example: Doug wrote a column in his industry newsletters entitled "Howick-citing" in other words, Doug's viewpoint. We think he'd appreciate Jim Bowden's newly minted pun for this occasion: "Howick-traordinary." ■

John H H Ho

Insights from an Industry Icon

Interview by Stephen L. Doggett

John Ho is the former owner of Aardwolf Pestkare in Singapore and he recently sold his business to Rollins. This interview discusses his insights into the pest management industry.

In truth, John Ho should be John Ohara, which has a Japanese heritage. I was 42 years of age when my mom told me that my father was Kazuo Ohara. He was an administrator in the war years, not a military person.

I was so shocked that I became sick for a week. My mom thought I was going to die before her time.

The rest is a different story, which I intend to relate in my autobiography, some day.

HOW MANY YEARS HAVE YOU BEEN IN THE PEST CONTROL INDUSTRY?

I have spent 38 wonderful years, or three quarters of my working life in the pest control industry.

WHAT POSITIONS HAVE YOU HAD DURING THIS TIME?

My first job was with a beverage company, Fraser & Neave Group, where I was trained to manage a factory. I later went on to be the Group Personnel Manager, Product Manager, Sales Manager and finally Export Manager.

My second job was with Rentokil, where I learned the art of managing a pest control business. My third and final appointment was with Aardwolf Pestkare, from where I retired as Group Managing Director.

TELL ME ABOUT YOUR HISTORY IN PEST CONTROL?

I was the Export Manager in Fraser & Neave when I decided to take on a career in the service industry. This was simply because I realised that I truly enjoy dealing with people.

But I nearly walked out of the interview with the headhunter who offered me the position. After the preliminaries, I asked for the name of the company, "Rentokil" was the reply. What business are they in? "Pest Control", was the nervous reply. What is their market position? "Number 3 or 4."

I thought to myself, "What a name, never heard of them, Pest Control...not sure if it is sustainable". In Fraser & Neave I was familiar with position 1 or 2, not 3 or 4!

So I stood up, stretched my hand for a polite "thank you" shake and said "I am sorry I think I have come for the wrong interview."

The interviewer was clearly surprised. He re-invited me to sit down and to give him the opportunity to explain, while I enjoyed his cup of coffee. I told myself, "John, shut up and sit down." When I was younger I was very impatient, capable of doing few things at one time, other than breathing.

He handed me some financial reports and because of my economics background I looked at certain figures and I exclaimed, "It looks like I can make a living here!"

"That is what I have been trying to tell you", was his happy response. After two more interviews, I scored the job as Managing Director.

"if we carried out this...today, I am sure the authorities would...put us in jail"

TELL ME ABOUT YOUR INITIAL IMPRESSIONS OF THE INDUSTRY.

Of course, it was not a smooth transition. My friends thought I had too much "Tiger Beer", to change to a position where I had little knowledge. But at 35 years of age, I knew no fear. I was hungry for the experience. I was going to build something that I could be proud of.

During the first 3 years I spent at least an hour every evening after dinner, reading anything I could find on pests. The most educational materials were the publications by the National Pest Control Association of the US (later re-named National Pest Management Association). I also attended seminars and courses that could help me upgrade my knowledge, including on management styles.

The satisfaction came when I was asked if I graduated in entomology. You can imagine the look when they learnt that

I read economics at University.

I realised that the secret to success is to surround myself with people who have skills and expertise that I did not have. Recruit them, pay them well, and give them space to perform their talents. If they are really that good, they will not disappoint. The challenge is how do you retain them? On average expect to keep them for between 3 and 5 years, before they will move on to seek their fortune elsewhere.

I remember once, in a single recruitment exercise, bringing in four young, enthusiastic and highly intelligent graduates, only to discover that they did not share my passion for pest control. After four years, we lost all four. That was an expensive lesson, for me.

In our haste to gain maximum client satisfaction, we had a lucrative contract to control mosquitoes in an exclusive residential area in a neighbouring country. After receiving endless complaints, we agreed to a supervisor's suggestion to fog the area using a long-residue termiticide. It worked. For more than a month there were no complaints. Of course, if we carried out this same treatment today, I am sure the authorities would suspend our licence and probably put us in jail.

WHAT WHERE THE BIGGEST CHANGES IN THE INDUSTRY THAT YOU OBSERVED DURING THIS TIME?

The changes have been wonderful.

There is now a greater awareness of the benefits of pest control. Having your neighbours see a pest control technician servicing your premises is no longer a black mark. In fact, it is a status symbol to be serviced by an up-market, professional company.

Recognising this, the industry has been upgrading its operations through training, employing technology, and using only approved pesticides. The Singapore National Environment Agency (NEA) has played a big role in this upgrading. The industry is beginning to be seen as "managing pests", not just squirting some pesticides with the hope of eliminating the pests. Hence the name "Pest Management" is most appropriate.

Of course, there are the operators who are not upgrading, either because of the lack of resources or their non-commitment to the long-term well-being of the industry. If they do not change, I am afraid they will be edged out.

Integrated technology is destined to play a bigger role in our industry. Hopefully its cost will come down, with greater demand.

With the intensive concern about global warming and the environment, the industry will have to change its mindset and employ more non-pesticide techniques. These are not as convenient as the traditional use of pesticides but that is the future direction. Of course, the pesticides today have also become friendlier in terms of their shorter residual life and the lesser amount being used.

IN FOUNDING AARDWOLF PESTKARE, WHAT WERE THE GREATEST CHALLENGES THAT YOU HAD TO OVERCOME IN ORDER TO BECOME ONE OF THE MOST SUCCESSFUL PEST CONTROL BUSINESSES IN SINGAPORE?

I would list my three greatest challenges:

The first was getting the Aardwolf Pestkare team to want to be professional, to be the best in quality. Once you have succeeded in getting everyone (or at least the majority) to think this way, half the battle is won.

It starts with simple things like getting the company toilets up to scratch, comparable to those of the better shopping malls. The team will not believe your quest for quality if they return to the office and find the amenities inadequate or badly maintained. They must return and see quality, feel quality and smell quality.

The second challenge was developing a training culture. To do this, I had to make sure that the staff learnt something new and exciting at every session. For example, when dealing with ants, they would be familiar with the life cycle but when you tell them that the male ant dies after a mating session, now that is interesting.

The third challenge, and it is still a challenge today, is recruiting the right people for the company. In a tight labour market, we are no longer fighting with our fellow competitors for the best talents. We are competing with Acer, Hewlett Packard, IBM, and even the casinos for our technicians. Unless we can offer a rewarding career, we will not be able to recruit the best.

BACK IN 2014, YOU ASKED ME TO SPEAK ON BED BUGS TO YOUR STAFF. WHAT WAS SO OBVIOUS TO ME WAS THE ENORMOUS RESPECT THAT YOUR EMPLOYEES HAD FOR YOU. HOW DID YOU MANAGE TO ACHIEVE THIS? CAN YOU DETAIL SOME OF THE SUPPORT PROGRAMS YOU HAD FOR YOUR EMPLOYEES?

Your staff know when you are faking. You have to have a genuine liking for them.

I have been very blessed with a supportive partner in Patrick Chong. We have enjoyed working together for 37 years and the trust that has been built.

He has designed some very effective incentive schemes. But the two schemes that stood out were the Profit Sharing

John performing magic!

Scheme and the Annual Bursary Scheme for the children of every employee.

YOU RECENTLY SOLD AARDWOLF PESTKARE TO THE LARGE NORTH AMERICAN FIRM, ROLLINS. WAS THIS IS A DIFFICULT DECISION?

This was indeed my most difficult business decision.

I suppose when you are aged 73 and have been working for 50 years, you have to think about retiring. Like they say, sell when the company is on the way up, not when it is on the way down.

It took me three years to finally sell it to Rollins Inc. of the United States. The main reason for choosing Rollins is that both companies share the same business philosophy and that is "this is a people business".

IN LIGHT OF YOUR RECENT SALE (AND THIS MAY BE A DIFFICULT QUESTION TO ANSWER!), DO YOU HAVE ANY CONCERNS THAT SO FEW COMPANIES ARE NOW DOMINATING THE GLOBAL PEST CONTROL MARKET?

My concern is that this should have happened a long time ago.

Businesses enjoy economies of scale when they become bigger. The global players will have more resources to upgrade the industry and to provide meaningful employment.

IS THERE ANY FUTURE FOR THE SMALL COMPANIES? WHAT WILL THEIR ROLE BE?

Although the ball game has changed, there is still a future for small pest management companies but they should have the financial resources and management know-how to succeed.

They have to find a niche in the market because the global players tend to be everything to everybody. They should avoid fighting the giants but develop a place in the market which is ignored. Build up a personal relationship with the client that is hard to break. To stay in business, you have to provide quality service delivered by trained and motivated people.

WHAT ARE THE CHALLENGES THE PEST CONTROL INDUSTRY WILL FACE IN THE FUTURE?

Recruitment of quality staff. That will be the biggest challenge. You must be prepared to pay for good people.

But to do that and let the company survive, you must charge a decent price that covers your cost. Gone are the days when you can charge a ridiculously low price and hope to survive by cutting back on your service.

Join the pest trade association and make your voice heard. The Singapore Pest Management Association is a good platform.

Stay informed of the developments on environment issues and observe the laws of the land.

WHAT DO YOU THINK THAT SINGAPORE CAN TEACH THE REST OF THE WORLD ABOUT PEST CONTROL?

Because Singapore is a small country, we are able to experiment and adapt to changes quickly. All countries have laws relating to public health and pest management, similar to and even stricter than Singapore's. But the big difference lies in enforcement. We have been described as a "fine city" but it is because of these penalties that we have also become known as a "safe city".

Thank you John. ■

Celebrating Rollin's acquistion of Aardwolf Pestkare

Overview

- **Title** FAOPMA-Pest Summit 2019 (Daejeon, Korea)
- **Date** Tuesday 24 – Friday 27, September, 2019
- **Venue** Daejeon Convention Center (DCC), Daejeon, Korea
- **Theme** One Health

Organization

General Chair	Won Soo Hong (KPCA)
Organizing Committee Chair	Byung Woo Kim (KPCA)
Steering Committee	Cheol Lee (KPCA)
Technical Committee	Kee Hyun Choi (KPCA)
Education Committee	Jae Ho Park (KPCA)
Publicity Committee	Seong Soo Kim (KPCA)
Event Committee	Kyu Yong Kim (KPCA)

Hosted by Federation of Asian & Oceania Pest Managers Association (FAOPMA)

Organized by KPCA (Korea Pest Control Association)

CHECK OUT OUR NEW WEBSITE!

The website has been completely designed to provide our visitors
to learn about all details of the FAOPMA-Pest Summit 2019 (Daejeon, Korea).
Visit us at www.faopma2019korea.org!

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Innovation, Collaboration, Openness, and Inclusiveness, Defines a Different International Event

Report of the 2018 FAOPMA-Pest Summit Event

By the Chinese Pest Control Association

Organized and hosted by the Chinese Pest Control Association (CPCA) and supported by the Federation of Asian and Oceania Pest Managers Associations, FAOPMA-Pest Summit 2018 was held at Shenzhen Convention and Exhibition Center, over 26-29th September in Shenzhen, China. The theme of the conference was "Pest and Health". Around 2,200 delegates, made up of industry leaders and professionals from 28 countries and regions, participated in the festivities in Shenzhen. The numbers of delegates, exhibition booths, and participating suppliers are among the highest for the history of the conference.

In addition to the unprecedented number of attendees, the event was also rich in content. There were 52 speakers covering wide-ranging topics. The speakers included many top experts in the technical field, distinguished scientists, renowned economists, and leaders of the industry. Among the reports presented during the conference, 65% were technical. These presentations covered recent trends in the pest management industry, such as the latest monitoring and tracking technologies, utilizing artificial intelligence and drones, pest control technology in food and pharmaceutical industries, latest mosquito control and dengue prevention, case studies for pest control campaign for major events, and many other fascinating topics. Further, there were also an array of business and policy-related talks throughout the conference; topics such as risk management for pesticide applications, industry-wide standards sharing, market analysis for the global industry, and how mobile and AI technologies are changing the face of our industry.

One thing worth-noting is the fact that all of the speakers were recommended by the members of FAOPMA and were carefully selected by a selection committee. This new attempt was to reflect the spirit of this conference: Innovation, Collaboration, Openness, and Inclusiveness, and also to ensure the diversity and the quality of the presentations, while engaging the audience with fresh content. Prior to the conference, the organizing committee also called for technical papers and published these papers in both Chinese and English as part of the conference packet.

In order for the delegates to be exposed to as many topics as possible, the conference was divided into the main venue and a number of breakout sessions from which the delegates could choose, based on their interests. These breakout sessions were spread out during the course of the conference and delegates sometime were faced with the challenging task of picking the most relevant to attend.

To mix things up, the conference also organized two very distinct special sessions for the delegates. One session highlighted the use of drones in pest control industry and another session focused on a Chinese home-grown company's inspiring journey from a rodent-glue board supplier to a multi-billion RMB company in less than 10 years. During the conference, the organizing committee also debuted a short public announcement film titled "Pride of Our Industry", which is aimed at improving the public image of the industry and educating the public about the vital role pest management plays in the community.

The conference logo was also a fruit of labour. The organizing committee announced a competition for the logo design and the final design was selected with the most votes among ten entries.

Members of the FAOPMA Executive Committee and Association representatives

During the conference, the host invited the leaders of the China National Health and Wellness Commission to introduce the creation of Chinese Industry Standards. Speakers and other experts in this field were invited to a session to exchange ideas on how to find common grounds among various standards from different countries. CPCA's Expert Committee proposed the initiative to share the Industry Standards among FAOPMA member countries. The proposal focuses on the importance of increasing awareness of these standards and improve industry's professionalism across the region.

Since joined FAOPMA's family, the CPCA dedicates itself to closely and respectfully working with our colleagues in Asia and Oceania region. From hosting the FAOPMA events in 1999 and 2009, to the launch event for the World Pest Day in 2017, we always pride ourselves in our commitment to social responsibility. The phenomenal growth for the Chinese pest control industry would not have been possible without the support from all FAOPMA members, for that, we are perpetually grateful.

Concurrently held during the conference, was the exhibition with more than 200 booths and tens of thousands of products on display. The conference also provided two grand banquets with performances to showcase Chinese culture.

The delegates who attended the event were excited about the industry's growth in Asia and the Oceanic region, as this event has proudly demonstrated. Most came away impressed by the powerful platform this event has created for the industry which has laid out a solid foundation for a bright future.

The Executive Committee and Annual General Meeting were also held during the conference.

FAOPMA-Pest Summit is a perfect platform for many countries and regions to learn, understand, and support one another. Through the years, many keen observers noticed the changes within the industry in their respective countries and regions. These changes may or may not be subtle in nature, but most of them are being closely influenced by political, economic and cultural shifts. In the increasing globalized world, some of these changes are no longer limited to a certain locale, rather, some might have global implications. These changes have the potential to shape our industry in the coming years. We believe that FAOPMA-Pest Summit is enjoying tremendous growth and popularity is due to the fact it is bringing our industry together and building a bridge to an even brighter future.

Are you ready for the future?

Let's all look forward to FAOPMA-Pest Summit 2019 in Korea - for more information, see Page 11.

Images from FAOPMA-Pest Summit 2018 appear over the next two pages. ■

Stephen L. Doggett

Stephen L. Doggett

FAOPMA Guidelines for the Hosting of Conferences and Events

This Guide Will Assist all Those who are Holding Conferences

Stephen L. Doggett and Raymond Lee

HOLDING A CONFERENCE? READ THIS FIRST!

Every year a conference is held under the joint banner of the Federation of Asian and Oceania Pest Managers Associations (FAOPMA) and Pest Summit Alliance. This is one of the biggest events worldwide in the annual calendar of pest management events. The conference is always hosted and organized by one of the FAOPMA member countries and is supported by FAOPMA. Yet holding a conference of such a scale is an incredibly daunting task and a major logistical feat that will require the involvement and cooperation of numerous individuals. To assist future host countries of these events, the FAOPMA Executive Committee is developing basic guidelines for FAOPMA-Pest Summit Organizing Committees. What follows are a few tips to help FAOPMA host country members to run FAOPMA-Pest Summit conferences smoothly and to be an outstanding success. This then ensures a memorable experience for sponsors, speakers, exhibitors, and all attendees.

DIFFERENT THINGS FOR DIFFERENT PEOPLE

People attend conferences for different reasons. Some are interested in business aspects and their attention tends towards the trade display. Others are hungry for knowledge and their focus is on the scientific program. Others may wish to network and catch up with old friends and colleagues. A good conference must cater for all these groups and not focus on just one element at the expense of others.

Past conferences in the region have helped to develop the 'spirit' of FAOPMA: namely one of cooperation and sharing, quality pest management, industry advancement and promotion, and ultimately the preservation of the health of the public we aim to protect. In this regard, many long lasting friendships amongst industry leaders and supporters, from both within the region and globally have been fostered by FAOPMA-Pest Summit conferences. These friendships, based on common interest of the pest management industry, have without question, lead to an improvement and strengthening of the pest management industry, not just within the FAOPMA region, but globally.

PLAN, PLAN, PLAN!

Time and Date. When planning a conference, the first important decision is the date of the FAOPMA-Pest Summit.

> *"holding a conference... is an incredibly daunting task...that will require the involvement and cooperation of numerous individuals"*

Decide on a date that does not clash with other major international events in the industry such as Pest World (hosted by the US National Pest Management Association) or various European conferences. Avoid festive seasons and peak periods for travel, which will result in lower numbers of delegates. Also consider the timing of local pest management events or even incorporate them with FAOPMA-Pest Summit. Always establish and announce the date of the event well in advance, at least 3-4 years ahead of time.

Organizing Committee. In organizing such a large event, it is imperative that the host country establish an Organizing Committee at least 24 months prior to the actual event. As the saying goes, "*failing* to *plan* is *planning* to *fail*!" It is recommended to include experienced FAOPMA Executive Committee members as **advisers** to your local Organizing Committee to help assist in the planning of the conference

Ensure the event is properly catered. Snacks and drinks (tea, coffee and water) should be available during breaks, and ensure all dietary requirements are accounted for. Meetings are often remembered in a poor light due to inadequate catering

and to ensure that the FAOPMA-Pest Summit meets everyone's' expectations. The involvement of these advisers is valuable and their experience will ultimately save you a great deal of time. With their network among the country members and the international fraternity, having FAOPMA advisors also ensures that you have the support from the industry and the connections needed to help run a professional event. Past conference experience is essential and it is always advisable to include on your organizing committee members from the previous conference.

The Conference Organisers must also develop a series of deadlines and a financial budget that is adhered too. They must meet regularly (at least fortnightly) to discuss the progress of the conference organization. Shortly prior to the conference, such Organizing Committee meetings are likely to be more frequent; there are always last minute unexpected issues or various important factors that require urgent attention. Minutes of all meetings must be kept and an ongoing list of Action Items recorded, which are then signed off once completed. All minutes must be forwarded to the FAOPMA Executive Committee within one week after the meeting.

A large conference takes a lot of planning. While you may have run smaller meetings in the past, an event involving several thousand attendees takes a tremendous amount of preparation. For such an event, a professional conference company or event Organiser will almost certainly be needed. You will also need a graphic designer to produced art work for flyers and other promotional materials, and a web designer for your internet site.

Venue and Location. For the venue, smaller hotels can handle up to around 120 participants. Beyond this amount it will be necessary to hold your event in a larger five-star hotel or a dedicated conference venue with Exhibition Hall capacity. Such sites can be extremely busy at certain times of the year (such as when Universities close for student breaks and during holiday periods). For the larger conferences, it will be necessary to lock the venue in often at least 3-4 years ahead of the event. Also contact any hotels nearby and ensure an adequate number of rooms are put aside during the time of the conference based on the expected attendance.

It is always necessary to examine a conference venue prior to the meeting to visualise how best the location would operate for your Conference and Exhibition. The FAOPMA-Pest Summit is always inclusive of Gala Dinners and other event highlights. Therefore, it is necessary to consider the food served for the dinner, bearing in mind cultural and religious differences of the international attendees. As the Exhibition Booths are considered an important part of the Conference event, as well as one of the main sources of income for the Organisers, it is necessary to ensure that there is enough space to cater for the exhibitors. For the main Meeting Hall where the lectures will take place, ensure that there is enough seating for all registrants. It is also prudent to check audio visual equipment to prevent any possible problem ahead of the event. Note that audio visual equipment may be a separate cost to the venue and may have to be booked with an external company. If this is the case, have them demonstrate that they have adequate equipment in advance.

Government support. Most Governments will offer some financial support when a large conference is held as meetings benefits the local economy. Always seek support from the Government, or relevant authorities, who may be in the position to render financial grants or support in kind to assist the conference. Any form of Government aid helps in the organization of the conference, and being the host country, the pride of the nation is also at stake.

CONFERENCE THEME

The Organizing Committee should develop a theme for the FAOPMA-Pest Summit and must contact the FAOPMA Executive to ensure that the theme fits in with the aims and philosophy of FAOPMA, which is to promote and develop the professional pest management industry throughout the region. Once FAOPMA approval is given, consider speakers with the right expertise and relevant experience in the subject relating to the thematic goals of the conference. A major consideration should be given to the Keynote Speaker(s). They may be a prominent government official of the host country, but should more commonly be a notable speaker in the field of expertise related to the conference theme. Ensure that all speakers are aware of the theme and even suggest possible titles to them. Avoid having speakers that have little experience in the field of pest management even if they are respected local figures.

LOCK IN SPEAKERS EARLY

One of the biggest attractions to your meeting will be the speakers. With the presence of international speakers and presenters at the past events, FAOPMA-Pest Summit has built a reputation as one of the industry's true global events. However, it is important to consider that renowned speakers are invited to numerous events and have a very busy schedule. This means that you need to approach them many months ahead, even a year or more, prior to the event. If they are a big name in the field of pest management then they may be speaking at multiple pest events throughout the year. However, this is not an issue, as a great speaker is a valuable addition to any meeting, and most registrants only attend one pest management event every year. Never

ask that a speaker pays for anything; you need to cover their full transport costs, accommodation fees, and registration expenses. Otherwise speakers will forego attending and you will end up with a third-rate program. Encourage speakers to stay for the entire event so that registrants have a chance to meet them on a more personal level and ask questions without the fear of doing so in front of a large audience. Ultimately speakers will help to make your event a commercial success and so you should pay them an honorarium (fee) for their efforts.

If you need a speaker's presentation early, let them know several months in advance and the reason why it is needed (perhaps for translation into other languages). Send them several reminders of the due date the presentation needs to be submitted. Most speakers will tweak their presentation in the days leading up to the event and thus expect the final talk to differ slightly. Always allow speakers to reload their presentation at the event – you do want the best talk possible with the latest information! Finally, never change a speaker's title without consulting them first.

During the presentations, the organisers should ensure that speakers are provided the respect they deserve. Prior to a speaker being introduced, confirm that their title and affiliation is correct. Provide a short summary of their experience in the introduction. The organisers and senior figures of the association hosting the event should be in attendance for all the presentations. There is nothing more insulting than seeing a Director of an association give their talk at the start of a meeting only to then disappear. Similarly, only invite dignitaries and VIPs to the meeting if they intend to stay for the remainder of the presentations. Again, it is very insulting to the speakers if there are rows of empty VIP chairs at the front of the lecture hall during later talks.

SPONSORSHIPS ARE GREAT TOOLS FOR PROMOTION

Once the Conference Theme and speakers have been established, this is the right time to call for sponsors. Invite all possible interested companies and suppliers in the industry to the event. Have a professional sponsor package produced that indicates the various levels of sponsorship, what the company receives with each sponsorship package, plus other information pertaining to the conference.

Ensure all suppliers and industry stakeholders have the same opportunity to purchase the sponsorship package to avoid any perception of bias. Always set a deadline for payment to prevent any legal disputes.

Once the sponsorship details have been confirmed, develop the promotional and advertising materials, and include the sponsors in the brochures and on the website, as appropriate according to the relevant sponsorship level.

EXHIBITORS ARE TERRIFIC!

A quality trade display is enjoyed by all delegates and can bring in much needed income to cover conference expenses. Thus, it is important to ensure that exhibitors are made to feel welcomed so that they come to future events. A professionally produced pamphlet for the exhibitors will make it clear what they will receive and how much each booth costs. Include a site map of the venue as certain booths are more popular (and generally more expensive to hire) than others, such as high visibility locations near entrances and registration desks. Include the size of the exhibit area so that the display can be planned. Provide details of what comes with the stand in case the exhibitor requires additional items. Once an exhibitor is confirmed, ask if other items are required, for example access to a power outlet. If power is required, it will be necessary to determine how many power points are required. Also provide details of local voltage and power adapters if universal power points are not provided by the venue. Remember that it is the conference Organisers who are responsible for booking stands, tables, and other items for the exhibitors, but you must communicate with the exhibitors beforehand as to their requirements.

Provide exhibitors with help on their arrival and escort them to their stand. Provide them with a contact number of one of the Organisers who speaks their language and can deal with any issue that may arise during the event. Ensure that lighting, power, and air conditioning are on during the set-up period. Give exhibitors the conference program so that they are aware of the busy times when delegates are likely to visit their booth. If possible, hold tea breaks and lunches in the exhibitor area, so that delegates can wander around the trade displays. Put aside a room for exhibitors only, where water, tea, coffee, and snacks are provided. Finally, have someone senior from the organizing committee go around all stands and personally thank the exhibitors and even provide some token of appreciation.

CERTIFICATION PROGRAMS AFTER THE CONFERENCE – ADDITIONAL TRAINING AND EDUCATION

FAOPMA has the common goal of advancing the pest management industry throughout the region in order to protect the communities that we serve. The incorporation of additional training and educational certification programs in conjunction with the conference is an added bonus for members who have travelled to the event and may encourage more registrants to attend. A small additional cost for the purpose of obtaining certification training would be a bonus for many and helps to fulfil the FAOPMA objective of advancing the pest management industry.

ADVERTISE, ADVERTISE, ADVERTISE!

As soon as you have received news of the successful bid to hold a conference, advertising should begin. Register a URL (web site), and onto the site, place dates, venue details, hotels in the areas, local highlights, travel advice, and other relevant information in multiple languages if necessary. Update on a regular basis. Promote your event through social media and newsletters.

A professionally designed brochure and registration form (if not online) should be prepared for promotion of the FAOPMA-Pest Summit event, which provides the program and highlights of the event. Start actively promoting in the FAOPMA Newsletter at least one year out from the event and include major speakers, especially if they have an international reputation. It is critical that the conference program is locked in early (at least nine months ahead of the event) so that delegates can determine if the conference is relevant to their business.

Contact the pest management media regarding the event and encourage Member Associations to distribute details of the meeting via their magazines and newsletters. Send both groups press releases well in advance, and as information and brochures are developed, send these as well. As new speakers are locked in or major events planned, send press releases informing this to both the Associations and media. Offer one free registration to key people in pest management magazines to encourage reporting of the event. After the event is over, produce a summary of the event that you can distribute to Member Associations and the media.

PROMOTION

It is advisable to seek the assistance of the FAOPMA secretariat to help coordinate the Conference promotion. Ideally, members of the Organizing Committee should try to visit the various FAOPMA member countries during their local AGM or pest events. This will help to provide an understanding of the people in the various nations in our region.

CONFERENCE REGISTRATION AND PAYMENT DETAILS

Once the web site has been established, try and streamline the registration process with online registration and payment. Ensure that the system is tested and functioning before going live. The online form should be easy to use, accessible in multiple languages, and provide confirmation of registration at the completion of the process as well as a payment receipt. The registration costs must take into consideration charges for credit card fees and other related banking charges. Try and encourage conference registrations through the National Association and provide a group discount to encourage more participants. It is not appropriate for National Associations to arrive at the meeting with multiple unregistered delegates as no guarantee for conference attendance can be given to any registrant who pays on the day of the meeting.

Once a registration form is received from a delegate, a confirmation letter should be sent to them immediately with a paid receipt. If accommodation is requested by the delegate, this should be booked by the Organisers and a confirmation of the booking from the hotel provided. Any other requests on the registration form (e.g. dietary issues), should be also noted on the confirmation letter.

COMMUNICATE, COMMUNICATE, COMMUNICATE!

We all have different rules and laws that must be abided by, and these could affect your delegates. For example, at a recent meeting, a publisher of an international pest magazine was not able to bring copies of their journal to give away at the event. The entire stock was confiscated at the border by government officials as the journal had not been pre-screened and cleared. As a conference Organiser, you must be aware of these and other potential problems and inform delegates of how their entry into the country can be as smooth as possible.

Advise all international delegates on visa and other official documentation required, as well as expected times to obtain approval to visit your country. A letter of invitation may be required for some countries. All of these requirements vary tremendously between governments and approvals can take time to obtain for certain nations.

ASSIST THOSE FROM FOREIGN NATIONS

It can be scary and quite daunting to enter a foreign country that does not speak your native language. Certain service industries, such as taxis, rarely speak anything but the local language. Thus, provide help guides for overseas visitors. This may include notes in the local language that indicate where the conference and local hotels are. Also book accommodation for delegates and include hotel information on the registration forms. Have a map of the area in multiple languages, which details some of the local tourist highlights. Such maps can often be provided free from local tourist information centres. Many delegates will be travelling with their partners and family, thus the conference Organisers should arrange day trips with a local tourist operator during the days of the conference, in addition to those often run before and after the conference.

Send a Conference Guide to all registered delegates. This should include; travel advice, local tours, choice of pick up arrangements available, and guides for transfers from the airport on arrival to the hotel and conference centre. Provide emergency contact phone numbers of the host country Organizing Committee in case any assistance is required. If possible, have a 'meet and great' desk counter at the airport arrival hall to assist arriving delegates.

PREPARE FOR THE WORST

It is wise to anticipate that unexpected issues will arise at the last minute. An emergency by definition is unexpected, yet being prepared for emergencies can mitigate their impacts. All chairs of each session should be provided with contact numbers in case there are audio visual problems. Have spare batteries for pointers (SLD: I don't know how many times these have died on me over the years, thus I always carry my own!) Registration desks should have the numbers of security, first aid officers, and ambulances, in case there are security or health emergencies. Conference Organisers should have alternative speakers ready in case a presenter has to pull out at the last moment. Contingency plans are essential for all meetings.

MORNING, LUNCH, AFTERNOON BREAKS, AND DIETARY REQUIREMENTS

Morning, afternoon and lunch breaks are a necessity with any conference. We all need toilet breaks, mental rests from presentations, and some sustenance in the form of tea, coffee or water, as well as a small snack in the morning and afternoon, as well as lunch. Such breaks are essential as conferences can be quite draining.

The number one complaint about events is food related. There is nothing worse than being at table where everyone is eating except for you. The fact is that there are a huge range of diets, based on religious, ethical, and dietary factors. This includes as an example, Kosher, gluten-free, nut-free, Hindu, Halal, vegetarian, vegan, Jain, low-lactose, and low sodium meals, to name just a few. These days, you can expect around 10-20% of attendees to have a dietary related issue and you must cater for all. The registration form must include dietary requirements of each delegate.

NAME TAGS

Many of us meet large numbers of people at the bigger industry events, and we may only see these people once every year. Thus, name tags help to avoid an embarrassing situation when one is unable to immediately recall a colleague's name. The name of the delegate should be in a large font, with the first name on top of the second. The name should be discernible from around three metres away. Titles are not necessary, and affiliations can be in a smaller font below the name. As name tags on lanyards rotate, it is always a good idea to print the name on both sides of the tag and have a clear window for holding the tags. Many conferences will include a list of all delegates but there may be privacy laws in some countries that may prevent you doing this without the expressed permission of the delegate. Thus, include a box on the registration form that seeks permission for contact details to be shared with others.

A small thank you gift should always be presented to the speakers. This superb example is a laser etched figure of the speaker given at the 2018 FAOPMA meeting in China

STICK TO THE CONFERENCE PROGRAM!

A printed program is provided for a good reason; so that delegates can plan ahead as to which talks and sessions that they wish to attend. To avoid disappointed attendees who have missed an important presentation due to a program glitch, it is important that the program is strictly followed. Any late changes should be announced at the start of the day.

TRAIN CHAIRS & AUDIO-VISUAL SUPPORT

A smooth-running conference is a professional meeting and more likely to be remembered favourably. However, this will not be a natural priority of everyone, especially those outside of the organizing committee. Often the biggest issue is from session chairs who allow speakers to go overtime, which can mess up an entire program. Clear directions should be given to the chairs including advice to ensure speakers stick to time. Provide chairs with timers, and warning cards (or bells) for speakers so that they are made aware of the time limits. Similarly, audio visual assistants must be trained to ensure that they know what to do if equipment fails. Ensure that there are spare batteries present for slide changes and spare slide changes. Some conferences venues use large digital screens rather than data projectors, meaning that laser pointers do not work. In this case, ensure mouse pointers are available. Have a laptop and digital timer on the lectern for the speakers, which ensures that they can keep track of time and do not have to keep turning back to the screen or looking down at the floor.

ACKNOWLEDGE THE SPEAKERS

Producing a quality presentation takes considerable time and public speaking has a high degree of stress, especially when there are hundreds to even thousands of people in the audience. Always publicly acknowledge the speaker's effort with a token of appreciation. This could be a bottle of wine or a small gift. Ideally this should have the name of the conference and date inscribed. The thank you gift should be presented by someone senior in the organization hosting the event; avoid asking someone who is not on the organizing committee or foreign to the hosting body.

CONFERENCE GALA DINNERS

The main reason that people attend conference dinners is to network with colleagues. While it is great to have some local cultural activities on display, ensure that there are adequate breaks between performances with quiet time particularly when meals are served. It is better to have too few displays then too many. Often Organisers waste vast sums of money on conference entertainment, when all people want to do is to chat amongst themselves. Also check sound levels and ensure that they are not too high such that diners have to yell in order to communicate. The choice of entertainment must be considered very carefully. The fact is that we live in a world of very diverse people, with different religions, different cultural identities, and different political beliefs. What could be entertaining to you, could be insulting to others (thus never use comedians).

THE SPEAKERS SLIDES ARE NOT YOURS!

In all cases, the speaker owns copyright to their presentation. It cannot be shared, or posted on any web site, unless you have written permission from the speaker. Many speakers will include unpublished information in their presentation and do not like to have this widely disseminated. Similarly, recordings of speakers should never be undertaken or shared without their permission.

CONFERENCE PROCEEDINGS

If you are going to have conference proceedings, then all papers must relate directly to presentations at the meeting. This is not a forum for publications irrelevant to the conference theme! For example, you would not include a paper on ovulating Peruvian Hamsters in a pest management meeting or some other totally unrelated topic. Papers for conference proceedings can be a problem for some speakers, as it can prevent them from publishing the same information elsewhere. Thus, respect their decision if they are unable to produce an article. A good compromise is simply for the presenter to submit a brief (one page) abstract summarising the key points of their presentation.

TRANSLATIONS PLEASE!

We all speak different languages, this is a reality. But it is terrible being forced to listen to a presentation by someone who does not speak your language. Allowing someone to speak without any translation is both arrogant and disrespectful to the audience. Always ensure that there are translators present, covering a range of languages. Simultaneous translations should be available where there are large numbers of delegates from the one nation. Such arrangements can be made in advance with the relevant National Association of that country. Negotiate ahead of time with the Association as to the minimum number of registered delegates required to qualify for free simultaneous translations.

AFTER THE EVENT

A conference does not finish on the last day of the event. Now is time for reflection: what worked well, what did not, how can it be improved in the future? These are just a few of the questions that need to be asked, recorded, and passed onto organizations that are holding the conference in the future. Provide detailed feedback sheets to all delegates and use this information to improve future events. Send personalised thank you letters to all speakers and exhibitors, and a thank you email to delegates. Some delegates may wish to receive a certificate of attendance, which can be used for maintaining their pest control licence, this should be asked on the registration form.

GIVE TO MEMBERS WHO CANNOT ATTEND

The annual FAOPMA-Pest Summit conference is one of the greatest events in the annual pest management calendar. You can hear about the latest in pest control research from the world's greatest experts, come up-to-date in current business trends and practices, learn about cutting-edge technology from companies and suppliers, meet like minds in the industry and gain new contacts, and develop life-long friends. ***Attendance to FAOPMA-Pest Summit will increase your knowledge and make you better in your role*!**

Unfortunately however, there are many reasons why not everyone can attend every year. Thus conference Organisers should aim to provide information from the meeting back to all members. Place photographs from the conference onto the conference web site and inform all FAOPMA members that they are available. Also, offer the images for use to those who are reporting on the event. Include Sponsor and Exhibitor information on the web site with a summary of the products on display with contact links. Encourage all speakers to produce a paper on their presentation, which can be included in this FAOPMA Newsletter. Note that as papers do take time to write, offer an increased honorarium if the speaker agrees to produce a publication.

Attending FAOPMA will lead to life-long friendships!

IN SUMMARY

As stated at the beginning, running a successful conference to please everyone is an incredibly challenging experience. Registrants pay a lot of money to attend your event and you have to ensure that they receive value for money. Furthermore, you may be hosting an annual event for an organization such as FAOPMA-Pest Summit, and a bad meeting could turn away sponsors, exhibitors, and registrants from future conferences. On the other hand, a successful FAOPMA event will inspire confidence from all groups and more support will be expected in the future. Thus, you have an obligation to the organization and should aim to hold the best event ever. A few simple tips as outlined in this article, can help ensure that your conference is remembered for good reasons, rather than bad. ■

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The PestWorld Experience

PestWorld is the Annual Pest Management Event Held by the NPMA

Conference report by Raymond Lee

PestWorld 2018 was held between November 23-26, at the Walt Disney World Swan and Dolphin Resort. Orlando, Florida, and is run by the National Pest Management Association (NPMA) of the United States. This year's event had more than 3,000 industry professionals from across the globe (representing around 65 countries) who journeyed to Orlando to celebrate the NPMA's 85th annual convention and exposition.

It was exciting to observe how Pest Management companies' network, share ideas and collaborate with one another. The huge exhibit hall had more than 200 exhibitors and provided delegates ample opportunities to explore the latest products. Here they were able to gain first-hand demonstrations on the latest products and services from Pest Management industry suppliers. The exposition provided ample opportunities for information sharing, and provided access to the latest products, services, and Pest Management technologies.

An observation noted from the exposition Hall and the various products on display, conveyed the notion that the Pest Management industry needs to transform the way insecticides are applied, and to use more baits and traps. There is a need to consider non-chemical means of control instead of using more insecticide products, which is necessary to ensure that the management processes have been effective. Perhaps Pest Management companies may consider that our next step is that of creating tools or devices, which can determine the perfect amount of insecticide required to achieve control?

The author (front right) celebrating with old friends

It was exciting to be in Orlando to attend the leading global Pest Management conference. This meeting generates critical thinking from the world-class papers that were presented. PestWorld places considerable emphasis on the pest management educational sessions. The various "breakout sessions" cater for specific needs and relevant topics that enable Pest Management companies to respond to the current digital economy and technology. In turn, this makes pest control more effective, more sustainable, and provides information at our fingertips. The business sessions enable us to understand the emerging marketing issues that influence the Pest Management industry.

Attending the annual PestWorld event is to make connections, network, and meet new friends in the industry. This is the "melting pot" where you go to meet up with international colleagues and have many opportunities to network with people in the industry.

Congratulations to FAOPMA President Madam Huang Xiaoyun, who was recognized at PestWorld 2018. Mdm Huang was honoured with the Global Ambassador Award for her astounding efforts to link the global industry players across Asia to the USA.

During the PestWorld 2018, the inaugural meeting of the *Global Pest Management Leaders Coalition* (GPMC) was held. The mission of the GPMC was reviewed and formally adopted as follows:

"The mission of the Global Pest Management Coalition is to create a unified voice across the globe promoting the value of pest management in ensuring the protection of health, home, food, and businesses"

The final Approval of Coalition structure, including Membership & Funding was adopted. The primary order of business for the GPMC meeting was to finalise the election for the Council for 2019. This included our FAOPMA President Elect, Mr Vasili Tsoutoura (AEPMA- Australia), and FAOPMA Committee member, Mr Jaldhi Trivedi (IPCA - India).

Finally, there was another important reason to have attended this year's PestWorld 2018 held in Orlando. A visit to this location provided the additional opportunity to reflect on the host city's most transformative figure: ***Walt Disney*** (of course!). ■

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Inaugural AGM of the Global Pest Management Leaders Coalition (GPMC)
October 26 at 11 – 1 p.m. Asia 1, Walt Disney Swan & Dolphin Resort
Orlando, Florida

Global Bed Bug Summit, Denver Colorado

GBBS is the Largest Bed Bug Related Event in the World

Conference report by Stephen L. Doggett

Denver, Colorado was the site for the 2018 Global Bed Bug Summit (GBBS), which ran over 27-29 November 2018. The GBBS was jointly hosted by the US National Pest Management Association and Bed Bug Central, who started the event way back in 2010.

The GBBS is held every second year, and what was expected to be a smaller event was the exact opposite. There was a record attendance, with some 550 attendees, indicating that bed bugs in the US are still not on the decline, despite the advances achieved elsewhere in the world.

The presentations kicked off with one of the living legends in the field of bed bugs, Dr Dini Miller of Virginia Tech, USA. Dini spoke on the latest breakthroughs and discoveries in bed bug science. One controversial area of research she touched on was the use of baits for bed bug control, in particular boric acid. The question Dini raised, was how to get bed bugs to feed on the baits when a nice juicy sleeping human is the tastier option.

Dini also touched on the issue of law suits and that several cases involving million dollar amounts have been awarded in recent years. In all cases with the successful litigation, the owner/manager of the facility was unaware of the infestations in the building. Often the managers made no attempt to determine the extent of infestations, did not know what their pest controller was doing, and usually tried to make residents pay for treatment. In all cases in the US, it is the landlord that is responsible for paying for bed bug control, even if the tenant introduced the insect. Dini stressed that it is critical that managers undertake and document that they have been proactive in bed bug monitoring, in order to reduce the risk of litigation.

Dini has also been investigating the economics of the new remote bed bug monitor from Delta Five compared with pitfall monitors. Delta Five (www.deltafive.com) has developed a remote bed bug monitoring sensor that if a bed bug enters the monitor, an alert is sent to a mobile phone with an image of the insect. While the Delta Five monitor involved a greater up front investment, the fact that they did not require on site inspection (as per pitfall traps), meant that the costs of these were highly favourable for ongoing monitoring. However, what was not discussed, was the relative efficacy of the new device against pitfall traps.

"the removal of bed bug allergens must become a routine component of [future] bed bug management programs"

One of the most interesting presentations was by Dr Zachary DeVries of North Carolina State University, who spoke on bed bug allergens. Allergens from dust mites and cockroaches have been well investigated as triggers for allergic reactions including respiratory issues such as asthma. However, such research has yet to be undertaken on bed bugs. For example with cockroaches, one female German roach produces 1.56ug of allergens, but the threshold for human sensitisation is only 0.28ug! Effective cockroach management can reduce environmental risk factors and lead to a significant reduction in allergens. Over three months of continual control, cockroach allergens can reduce to levels below where human morbidity occurs. However, this is not the case for bed bugs.

Bed bugs release a range of aggregation pheromones, both volatile and non-volatile compounds such as histamines. Over three months of continual control, Zachary found that there was no decline in bed bug allergens. This means that even if the infestation was eradicated, the allergens could trigger respiratory complaints for a long time

The keynote was give by Dr Dini Miller of Virgina Tech, USA

afterwards. Perhaps also, with the continual presence of aggregation pheromones, infestations could become more easily established. In the future, the removal of bed bug allergens must become a routine component of bed bug management programs.

My presentation focused on insecticide resistance and asked the key question, "Is resistance to blame for control failures?" A history of insecticide resistance in bed bugs was provided, a discussion on resistance mechanisms, why different laboratories achieve variable results in efficacy testing, and what resistance means for the pest manager. Most control failures are the result of not recognising and treating all bed bug harbourages. The key message is that resistance cannot be blamed for control failures, but it does make the possibility of successful control much harder.

The event was well supported by exhibitors, with some 45 stalls. As per usual, there was a range of chemical manufacturers present with application equipment, heat machines were being promoted by multiple companies, and business related providers were on display. Arguably of most interest was the new biopesticide from the company ConidioTec, called Aprehend.

Aprehend is made from a fungal pathogen of insects, *Beauveria bassiana*. This fungi has been long known and used for the control of a variety of insect pests but only recently formulated for bed bug management. Trials on bed bug infestations have shown the product to be highly effective at controlling infestations, with only a single application usually required. Furthermore, it has a residual life of up to three months and so can be used for preventative treatments on a quarterly basis. The only downside is that the fungus is heat sensitive and starts breaking down around 30°C. While this could be an issue for applications in warmer climates against the Tropical bed bug (*Cimex hemipterus*), for much of Europe and the US, this is less of an issue.

Two popular regular events again held at this year's GBBS where the Beer Tasting Session and the Night Out with the Experts. The Beer Tasting Session is held amongst the trade display and allows time to view all the exhibitors' wares. The Night Out with the Experts is where all the delegates have a chance to mingle with the speakers and ask them questions in the more informal atmosphere of a hotel bar. Good questions are rewarded with a free drink ticket!

The other key happening at the GBBS was a book signing associated the new text, *Advances in the Biology and Management of Modern Bed Bugs* (see book review on the following pages). All three editors were present, including Prof. Chow-Yang Lee (Universti Sains Malaysia), Dini Miller, and myself. We spent an hour inscribing our signatures on the books of keen readers who wished to learn about the latest and greatest in bed bug trends and management. The result was that all copies of the book were sold.

In spite of the somewhat grandiose name, the GBBS is very US centric, with only two international speakers (Prof. Chow-Yang Lee and myself) and few overseas registrants. However, it is the premier global event where one can learn about the latest in bed bugs and their management, and certainly worth attending if you are involved in managing this nuisance public health pest. ■

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Editors of *Advances in the Biology and Management of Modern Bed Bugs* signing books

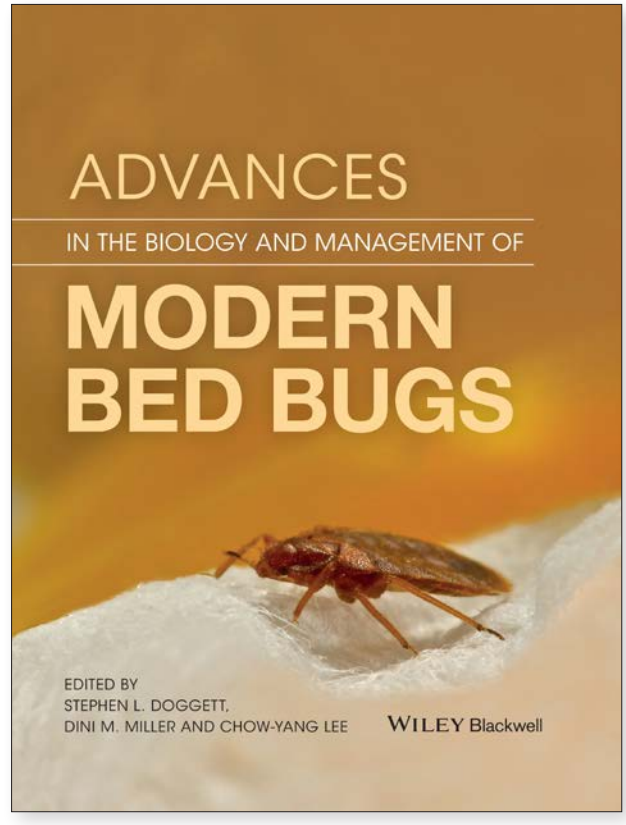
ADVANCES IN THE BIOLOGY AND MANAGEMENT OF MODERN BED BUGS

The First Bed Bug Textbook for 50 Years!

Stephen L. Doggett, Dini Miller and Chow-Yang Lee

Over the last two decades, the world has seen an unprecedented resurgence in bed bugs. This has been as unexpected as it has been dramatic, with no sector of society being exempt from a possible infestation. Furthermore, the resurgence has involved huge financial costs; there is no question that these nuisance insects are impacting the world economy billions of dollars annually. In Australia alone, it was estimated that bed bugs had a fiscal cost on the economy of over $200 million dollars between the years 2000 to 2012!

Perhaps one of the most unusual aspects of the resurgence is that it has simultaneously involved two species, the Common bed bug, *Cimex lectularius* L., and the Tropical bed bug, *Cimex hemipterus* (F.). The return of these public health pests has prompted a renewed interest in bed bug research and numerous papers have been published in recent years covering a multiple of disciplines. It is now becoming difficult for the average researcher to assimilate all the information available on bed bugs and thus there is a need for a new academic text that reviews all the literature from the past to the present, and offers it in a readily digestible form. Hence the birth of the new text, *Advances in the Biology and Management of Modern Bed Bugs* (*ADVANCES*).



INTRODUCTION

It has been just over 50 years since the publication of Robert Usinger's seminal text, *Monograph of Cimicidae*, long considered the 'Bible' of the bed bug world. At the time of publication in 1966, bed bugs were on the global decline, apparently defeated forever through the use of powerful insecticides such as DDT, the other organochlorines, and

later the organophosphates. Then in the late 1990's reports of bed bugs becoming more frequent started to surface in academic publications, pest management industry magazines, and other forums.

The first indication of a resurgence came from a letter that appeared in the *Medical Post*, suggesting anecdotally that bed bugs were becoming increasingly common in the UK and that only the older pesticides were effective at controlling them (Birchard, 1998). This paper was also the first to hint at a possible key trigger of the modern resurgence, namely the development of insecticide resistance within bed bugs. Another letter sent to the *British Medical Journal* in 2000, also suggested a possible resurgence, the authors stating that they had received four bed bug samples in 1999, compared to one in 1998 (Paul and Bates, 2000). However, the first scientific report that provided concrete data of a bed bug resurgence was from the Medical Entomology Department at Westmead Hospital in 2004, where an increase of over 400% was recorded in the number of bed bug samples submitted to the Department's pathology service since the beginning of 2001. In the same report it was noted that some pest management companies had seen a rise in treatments of almost 700% during a similar period (Doggett et al., 2004). The same group had previously reported on the presence of the Tropical bed bug, *Cimex hemipterus*, for the first time in Australia (Doggett et al., 2003), pointing to a resurgence of both *C. hemipterus* as well as the Common bed bug, *Cimex lectularius*. In the US, pest management industry publications also reported an anecdotal increase in the number of bed bug treatments from the late 1990's and early 2000's (Pinto, 1999; Katz, 2000, Anon, 2001; Anon, 2002). Subsequently, reports of a bed bug resurgence began to appear from all around the world.

With the global rise of bed bug populations, there has also been a renewed interest in bed bug research. Over the years 2000-2016, the citation indexing service, PubMed, listed 494 peer-reviewed papers on *Cimex*, but only 259 between the years 1912-1999. Furthermore, research has occurred across disparate fields making it challenging for all scholars and anyone dealing with bed bug management to keep up-to-date with contemporary investigations and innovations. Thus there is a need to distil all of this research into a modern text, and hence the birth of *Advances in the Biology and Management of Modern Bed Bugs*.

ADVANCES – AN OVERVIEW

ADVANCES is a complete synthesis of bed bug information from the past to the present, is more than 460 pages in length, and has more than 60 contributors from across the globe, including many of the most recognisable names in the field of bed bugs today. There are eight main parts, 46 chapters, a foreword (kindly provided by Dr Harold Harlan, considered by many to be the 'grandfather' of modern bed bug research), an introduction by the editors, and a conclusion that examines the future of bed bugs and research needs (. *ADVANCES* has been four years in the making and was edited by Stephen Doggett (NSW Health Pathology, Westmead Hospital), Dini Miller (Virginia Tech) and Chow-Yang Lee (University Sains Malaysia). These editors directly contributed to 20 of the chapters.

ADVANCES - THE DETAILS

The first part, *Bed Bugs in Society*, contains two papers. The initial chapter, *Bed Bugs Through History*, reviews the early methods of extermination, and the origins and subsequent spread of bed bugs throughout the world. The second chapter, *Bed Bugs in Popular Culture*, shows the intimate relationship that humans and bed bugs have had through history, via the use of bed bugs in popular culture. For example over the years, bed bugs have appeared in poetry, art, theatre, literature, music, and more recently, in television. Bed bugs were a popular topic of postcards during the early 1990's and have even been used in erotica.

The part on *The Global Bed Bug Resurgence* contains contributions from all the major populated regions across the world, including chapters from North America, Latin America, Europe and Russia, Asia, Africa, the Middle East, India and the subcontinent, and Australia. Each chapter reviews the history of bed bugs in their respective region, and discusses the resurgence and strategies employed to combat the return of the bed bug.

Bed Bug Impacts reviews the dermatological, mental health, and miscellaneous health impacts associated with bed bugs. The evidence and potential for bed bugs to transmit infectious diseases is also discussed. While the health related impacts of bed bugs are arguably relatively minor (especially compared with known vectors), the fiscal impacts are highly significant. Thus the last chapter of this section reviews the monetary impacts caused by bed bugs.

Bed Bug Biology covers topics such as host seeking and blood feeding behaviours, harbourage selection and aggregation, dispersal, chemical ecology, population genetics, physiology, symbionts, and laboratory maintenance. Including aspects of biology in *ADVANCES* is important as such information forms the basis of control strategies.

The part, *Bed Bug Management,* begins with a review of the three main industry standards that have been developed to help guide bed bug management practices. These are followed by a chapter on how a large multinational pest management firm deals with bed bug management to ensure a consistency of treatments and a positive outcome by all of their technicians. Also included are chapters on prevention (which is largely about reducing the risk of bed bugs), detection and monitoring, non-chemical management, insecticide resistance, and chemical control. With the emergence on the market of many products that are not very efficacious, the next chapter focuses on the inherent limitations in bed bug management technology. The final chapter centres on bed bug education and ensuring that the correct message is given to the community on how to minimize the risk of bed bugs and how to properly manage an infestation.

In *Bed Bug Control in Specific Situations*, experts in the industry highlight the challenges they have experienced in managing bed bugs in some of the most difficult situations possible. Discussed are the various issues faced in achieving control and the key elements that have led to a successful outcome.

With the growing litigation over bed bugs, and legal cases involving many millions of dollars, the theme of the last major part of the book is *Bed Bugs and the Law.* Topics include the legal requirements of professional pest

managers and the products they use, laws relating to bed bugs, and legal cases studies involving bed bugs.

***ADVANCES* – OBJECTIVES & RELEASE DATE**

ADVANCES aims to be a reference book for academic researchers and students alike, however it is largely written in an easy to read format, making the information accessible to all.

It will prove to be a valuable text for those in the hospitality industry and accommodation managers, who are tasked with the job of minimizing the risk of bed bugs in their facility, or have to manage the processes of eradication of active infestations. With the growth in bed bug litigation across the world, both the litigant and defendant legal teams will find *ADVANCES* an indispensable source of contemporary information, which will assist in their legal preparations. Importantly, *ADVANCES* provides up-to-date information for the professional pest manager on bed bug biology and management. *ADVANCES* is published by Wiley-Blackwell, released in 2018, and available from all major book stores.

For more information and to see sample chapters, abstracts, and a video of the editors discussing the book, go to **www.abmmbb.com**. ■

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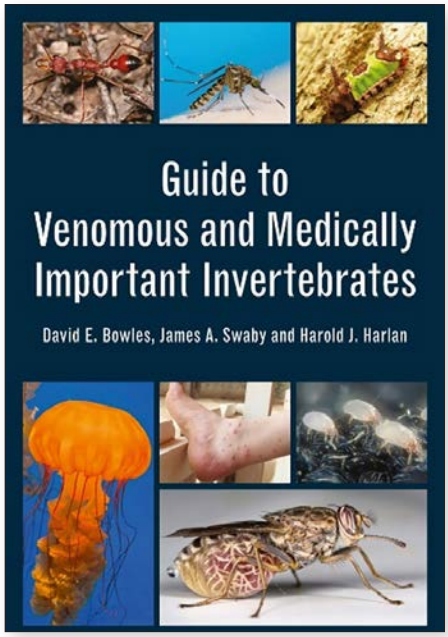
COI Statement: The Chief Editor of the FAOPMA Newsletter is also the Chief Editor on this text book.

The Editors: Stephen Doggett, Dini Miller and Chow-Yang Lee



Guide to Venomous and Medically Important Invertebrates

David E. Bowles, James A. Swaby, and Harold J. Harlan

Book review by Stephen L. Doggett

In recent years, there has been a deluge of books on medical entomology, for the academic, the student, the clinician, and for the lay person. This includes *Medical and Veterinary Entomology* by G.R. Mullen and L.A. Durden (2018), *A Manual of Medical Entomology: Medical Veterinary & Forensic Entomology* by A.I. Hasaballah (2017), *Handbook of Medical Entomology* by W.M.A. Riley and O.A. Johannsen (2014), *The Encyclopedia of Medical & Veterinary Entomology* by R.C. Russell, D. Otranto and R.L. Wall (2013), *Medical Entomology for Students* by M. Service (2012), *Physician's Guide to Arthropods of Medical Importance* by J. Goddard (2012), and *Prevention of Bug Bites, Stings, and Disease* by D. Strickman, S.P. Frances and M. Debboun (2009).

In such a crowded marketplace a new text must stand out from the crowd. Thus does a *Guide to Venomous and Medically Important Invertebrates* (*GVMII*) deliver in this respect? It most certainly does!

Firstly, what is the book about? According to the authors, *GVMII* "describes the health threats posed by invertebrate groups, worldwide, from physical pain and annoyance to disease transmission risk… (and)… aids in the identification of potentially harmful invertebrates."

What makes this book special is that it has been so beautifully produced by CSIRO Publishing, with over 260 high-quality full colour images (conflict of interest statement here; I provided a number of photographs free of charge).

The images include an array of invertebrates and the clinical damage they cause to humans. Plus there over 90 maps detailing the distribution of the invertebrates where they do not have a global spread. Furthermore, the text is easy to read, even by those with little experience in the world of medical entomology.

Many of the insects that the pest manager has to treat on a daily basis are covered by *GVMII*. This includes cockroaches, bed bugs, ants, moths, spiders, and flies, to name but a few. It is important that the pest manager knows how these pests can impinge on the health of their customer.

Also included are selected references for further information and an excellent glossary. A series of appendices contain information on personal repellents and common vector-borne diseases. For most of the books mentioned above, they tend to only focus on medical important arthropods, such as ticks, spiders, and insects. Thus it is a delight to see the scope of *GVMII* extend to cover many other groups such as molluscs, sponges, jellyfish, echinoderms, worms, and other invertebrates that are normally not mentioned.

GVMII has been produced by three renowned military entomologists; David Bowles, James Swaby, and Harold Harlan. In the world of bed bugs, the last author is a household name. This is largely due to a bed bug strain collected by Harold in the 1960s having become the standard susceptible strain used by laboratories across the US. What is known as the 'Fort Dix' strain, is more often affectionately termed the 'Harlan' strain after Harold, who has generously supplied his bed bugs to anyone who requested them.

With such terrific images, useful distribution maps, and a writing style that is easily digestible, GVMII will prove to be a useful reference for many years to come.

A *Guide to Venomous and Medically Important Invertebrates* is produced by CSIRO Publishing, (228 pages), USD$43.18, ISBN: 978 1 4863 0884 2. ■

Bedbug

Klaus Reinhardt

Book review by Stephen L. Doggett

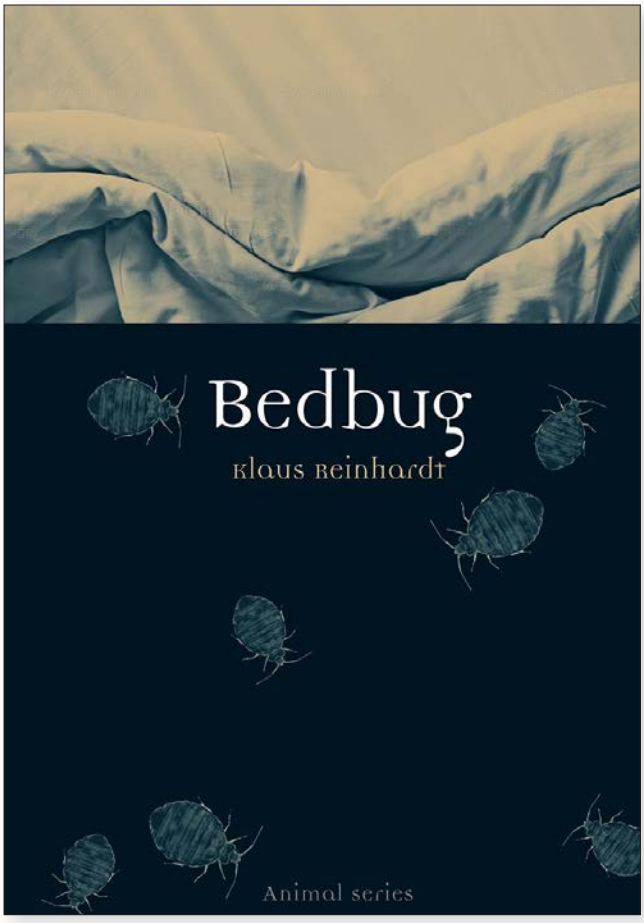
This year will be seen as the year of the bed bug books. Ok, there has only been two, but this is two more than most years!

The latest offering is *Bedbug* from Dr Klaus Reinhardt of the Institute for Zoology, Technische Universität in Dresden, Germany. Klaus Reinhardt undertook his PhD in one of the most notable institutes for bed bug research, Sheffield University (England), under the tutelage of Prof. Mike Siva-Jothy.

Sheffield University was the home for one of the great bed bug investigators of the pre-WWII era, Kenneth Mellanby, who studied various aspects of the physiology of the common bed bug, *Cimex lectularius*. In more recent years, Mike Siva-Jothy and his team, have been at the forefront of

"the forefront of exploring the bizarre sexual mating...known as traumatic insemination"

Stephen L. Doggett



exploring the bizarre sexual mating behaviour of bed bugs known as traumatic insemination. Thus Klaus Reinhardt has the experience, and knowledge, to produce a quality book on bed bugs.

Bedbug is divided into nine chapters. Chapter 1 focuses on the diversity of the Cimicidae, the family that includes bed bugs. Chapter 2 examines the history of bed bugs in human civilization, from the discovery of bed bugs in Egyptian remains dating back to 3,600BC, through the Middle Ages, to more modern times. Chapter 3 reviews the biology of the insects. The next chapter (4) discusses traumatic insemination, where basically the male penis stabs the female in the abdomen to inject sperm. Unsurprisingly, this is not always very healthy for the female! Chapter 5 looks at the bite of the bed bug and the adverse reaction this can have on humans. Chapter 6 expands on the previous chapter, with a discussion on the laboratory colonization of bed bugs. This chapter also examines the fears that bed bugs provoke in humans and the basis of these fears. Chapter 7 reflects on how humans have controlled bed bugs through the years. Chapter 8 is titled 'The Other Bug' and is a somewhat strange section (and even disturbing) where the meaning is not always clear. Here the author focuses on the derogatory use of the terms 'bug' and 'bed bug'. He extends the discussion to the sad time of Nazi Germany and the Holocaust, and how the Jews were compared to bed bugs by the Nazis as a justification for their attempted extermination. The final chapter deliberates on the infiltration of bed bugs into language, literature, and popular culture.

Bedbug does contain a few small errors and contentious comments. For example, on page 83, it is stated that bed bugs inject an anaesthetic in their host to numb the bite during feeding. In actual fact there is no evidence that bed bugs deliver any pain killing agent. The reason why we do not feel the bite is thought to be due to the fine nature of the stylets that are inserted during feeding.

Later on page 125, it is suggested that the decline in bed bugs during the 1950's being attributed to the use of DDT is a myth, as bed bugs infestations started to reduce in number within the United Kingdom before the 1950's. Few researchers would suggest that the decline in bed bugs post WWII was not due to the introduction of powerful new insecticides. It is certainly true that bed bug numbers did start to decline during the inter-war years due to a number of key developments. This included the introduction of fumigants such as hydrocyanic acid and sulphur dioxide around the mid-1910's. In 1934, both the Scottish and English Departments of Health recognised the problem of bed bugs and developed effective management guidelines, which further reduced the number of infestations in the country. Thus bed bugs were under attack on multiple fronts before DDT and the other organochlorines, and the organophosphates, became widely available and reduced bed bug populations in economically advantaged nations for almost five decades. Just prior to the start of the new millennium, resistant strains started to spread around the world, which then resulted in the modern resurgence.

Another issue is the title itself, '*Bedbug*', which is not strictly correct. When it comes to common names, entomologists have a simple rule. If the insects belongs to the taxonomic group implied in its common name, then it is written as two words, if not, then it is written as one word. Thus as butterflies are not flies, and ladybugs are beetles, one word is used for both. Whereas for bed bugs, they are true bugs (i.e. belonging to the order Hemiptera) and therefore should be written as two words. This simple rule should really be adhered too and most scientists keep 'bed' and 'bug' separate.

Furthermore, it is obvious that the author does not have English as his first language. At times the writing appears rambling and disconnected, grammatical rules are used flexibly, and the meaning of some sections is not always clear. The book would have greatly benefited from more careful proof reading and a review by a colleague with knowledge of bed bugs.

Sure, this review is being overly critical, but this is what a book review is about! In actual fact, the gripes are mostly trivial, and *Bedbug* contains a wealth of information that will be new to even the most experienced bed bug researcher. This a book that you will learn a lot about bed bugs and is a generally easy read. Plus it is quite inexpensive being under USD$20. I thoroughly recommend this publication and it is a worthy edition to your book shelf, especially if you undertake bed bug management or research.

Bedbug is published by Reaktion Books, (184 pages), USD$18.80, ISBN: 978 1 78023 973 6. ■

Urban Pest Control: A Practitioner's Guide

Partho Dhang

Review by Dr David Lilly

For Pest Managers entering the profession, finding the right guide to inform your business and services can be difficult. Many of the most well-recognized books originate from North America (such as the *Mallis Handbook of Pest Control* and *Truman's Scientific Guide to Pest Management Operations*). These may include pests, products, and even service practices that may not be relevant to your country or region. Different texts may be too expensive, overly complex or scientific, while others could be outdated for today's modern technician or business owner. Thus, an affordable, well-informed, and accessibly-written service manual can be highly valued by many in the industry.

Enter to this arena Dr Partho Dhang who, in addition to, *Climate Change Impacts on Urban Pests* (2017), *Urban Insect Pests: Sustainable Management Strategies* (2014), and *Urban Pest Management: An Environmental Perspective* (2011), has found time to author ***Urban Pest Control: A Practitioner's Guide*** (2018). Covering each of the major pest groups, and situations in which they may occur, the book has been written in an approachable language and manner, and tops out at an agreeable 13 chapters across just under 120 pages.

In contrast to most field service guides, Dr Dhang opens with some discussion about trends and challenges associated with being a pest control business in today's world (Chapter 1 – Understanding the Business of Controlling Pests). This is a refreshing approach, and is reinforced by his openness and lament at the the gradual disappearance of the technical knowledge and skills required to prevent or manage pest insects, without first resorting to liquid sprays.

The following chapters deal each with various pest groups, covering all the usual suspects, including: cockroaches, flies, mosquitoes, bed bugs, termites, 'sporadic pests' (e.g. ants, fleas, ticks, etc.), stored product pests, and rodents. The appendix also includes several useful diagrams and charts, including a simple but practical identification key to the larvae of common household pests. All chapters are well written, and of an appropriate technical level that they would be engaging for someone new to the industry, or in the first few years of their career. Again, it is also good to see that across each of these chapters, the importance of inspection and habitat modification is promoted before treatment, in addition to the role that follow-up inspections and treatments can play in the for success of your services.

Insecticides and their application are dealt with in Chapters 10 and 11. And, refreshingly, both the advantages *and disadvantages* are discussed regarding various insecticide formulations, modes of action, and their suitability to different environments or applications. As an industry, we would do well to be mindful of the pros and cons of our work more often, so it is positive to see such detail and consideration given to these chapters.

Another section of particular worth is the idea that IPM could be considered as a 'value-added service' (Chapter 12), given the potential positive cost-benefit that comes with pursuing an IPM approach versus strictly conventional treatments. From a business perspective, this could be an area of future potential, and thus deserves some consideration.

My only minor gripe is that, on occasion, the organization of the book can be a little confusing, due simply to the way pests have been categorized. For instance, Termites are predominantly dealt with in Chapter 6 (Household Pests and Their Control – Termites), yet this is limited only to several key subterranean species. However, for Drywood termites, you must move on to Chapter 7 where they are categorized under the banner of 'Sporadic Pests and Their Control'. Dampwood termites, whilst no doubt less of a concern to society, fail to receive any significant detail in either chapter.

Finally, it would also have been of value to perhaps had one more chapter from Dr Dhang, with some thoughts and consideration as to the future, so that Pest Managers could begin to consider some of the trends and challenges that an urban pest manager may face (e.g. digitalization, increasing regulation, animal welfare, and safe food etc.). But perhaps this is fodder for the next book! USD$29.69 ■

SINGAPORE PEST MANAGEMENT ASSOCIATION

SINGAPORE URBAN PEST MANAGEMENT FORUM 2019

SPMA

24-25 April 2019
Orchid Country Club
Singapore

To be officiated by the Minister for the Environment and Water Resources, **Mr Masagos Zulkifli**

Vanda Course, Orchid Country Club

Towards Innovative, Smart & Green Pest Management

KEYNOTE SPEAKER

Dr Lee-Ching Ng
National Environment Agency (NEA), Singapore

Singapore Pest Management Association (SPMA) is proud to host its national-level Singapore Pest Management Forum 2019. This convention targets pest management professionals, solution providers, government agencies and service buyers in environmental health, vector control and pest management industry.

Join us for 1.5 days as we explore the urban pest management in Singapore from the lens of innovation, smart technology and sustainability.

Supported by:
National Environment Agency (NEA)
Employment and Employability Institute (e2i)

Distinguished Speakers

Dr Chee-Seng Chong
National Environment Agency (NEA), Singapore.

Dr Stephen Doggett
Westmead Hospital, Sydney, Australia.

Dr Ary Faraji
Salt Lake City Mosquito Abatement District, USA

Dr G Veera Singham
Universiti Sains Malaysia (USM), Malaysia.

Dr Chong-Chin Heo
Universiti Teknologi MARA, Malaysia.

Dr S Khoirul Himmi
Indonesian Institute of Sciences (LIPI), Indonesia.

Dr Agnes Kocu
National Environment Agency (NEA), Singapore.

Prof Dr Chow-Yang Lee
Universiti Sains Malaysia (USM), Malaysia.

Dr Christina Liew
National Environment Agency (NEA), Singapore.

Dr Chin-Cheng Yang
Kyoto University, Japan.

Dr Grace Yap
National Environment Agency (NEA), Singapore.

Dr Wan Fatma Zuharah
Universiti Sains Malaysia (USM), Malaysia.

SAVE THE DATE

For more information, please email contactus@spma.com.sg

FAOPMA Member News

The Latest in Happenings and Events from the Associations in our Region

Please send your report to Stephen L. Doggett or David Lilly

INDIA: A REPORT ON SOCIAL WORK CARRIED OUT BY THE INDIAN PEST CONTROL ASSOCIATION (IPCA) IN KERALA DURING THE RECENT DEVASTATING FLOODS

By Uday Menon

The managing Committee of the Indian Pest Control Association (IPCA) under leadership of President Jaldhi Trivedi decided to extend a helping hand to the people of Kerala in the aftermath of the devastating floods. Vice President Mr. Uday Menon was appointed as the coordinator to develop and execute the assistance program.

It was decided that the IPCA would intervene in the field of Pest Management relevant to our field of expertise.

The situation was assessed through reports and via direct observation from our members in Cochin. It was found that almost the whole region of Kerala was affected but some districts were significantly more impacted than others. It was decided that the worst affected areas would be targeted in the assistance program.

As the receding waters were creating isolated water pockets, an outbreak of vector-borne disease was anticipated due to mosquito and fly breeding. Since most of the region was still flooded, access was very limited, plus people movements into the area were largely restricted to government health workers. Hence, it was decided that IPCA would extend its support through the supply of insecticides to the Government and to train personnel on vector management.

Thus the IPCA supplied mosquito and fly management chemicals to health and relief work teams and provided operational instructions through leaflets, product pamphlets, presentations, and face-to-face training.

Bayer Crop Science was approached with our intentions and they readily provided us with a large quantity of Barcelo Tabs, Barcelo Granules, Quick Bayt, and Kingfog, at no cost. This was a very generous gesture and the IPCA acknowledges our gratitude to them. The material received from Bayer Crop Science was distributed to the affected locations through various support staff.

Technicians of IPCA Member organizations also participated in the application and fogging programs when they were permitted to do so.

Mr. Menon also toured affected localities, along with local IPCA members. He discussed vector control with various district officers and trained field workers on aspects of vector management. ■

Vice President Mr. Uday Menon training officers and staff on correct vector management practices

JAPAN: NEWS FROM JPCA

Provided by Japanese Pest Control Association

February 2018 saw the running of the Pest Control Forum. This was jointly run between the JPCA, Japan Environmental Sanitation Center (NPO), and public health departments of prefectural & city

governments from throughout Japan. The meeting was supported by the Ministry of Health, Labor and Welfare, and the Ministry of the Environment.

Japan held their "National Pest Day" on 4th June 2018. This is organized by the JPCA and the regional pest control associations. The purpose is to promote public awareness of the pest industry and around 50% of Japan's 47 regional pest control associations participated. Each participating association plan and run their own version of "Pest Day" events in their respective region. The events are generally held on busy streets or inside shopping malls. Displays may include exhibits of live insects, pest photographs, games and activities, free pest problem consultation, and lectures. Some associations organize unique events such as wearing bee control costumes while competing in their local marathon. Some of the more successful displays had over 3,000 visitations. The JPCA supports the events by securing government support from the Ministry of Health, Labor and Welfare and the Ministry of the Environment. The JPCA also provides various novelty goods, posters, and flags to use at the events.

The Japanese Society of Pestology held their annual conference in November 2018, which has been running every year since 1985. The meeting comprised 357 members including, pest control companies, professors, suppliers, amongst others. There were some 50 presentations relating to pest management provided by pest control professionals and academic researchers. ■

SINGAPORE: NEWS FROM THE SPMA

Provided by the Singapore Pest Management Association

The Singapore Pest Management Association (SPMA) is proud to host their national-level Singapore Pest Management Forum 2019. The theme is "Towards Innovative, Smart and Green Pest Management". The meeting will be held at the Orchid Country Club (Singapore) over 24-25th April 2019. In line with Singapore Government's Environmental Services Industry Transformation Map (ITM), this convention targets local pest management professionals, solution providers, government agencies, and service buyers in environmental health, vector control, and the pest management industry.

Save the date and join us as we explore pest management in Singapore from the lens of innovation, smart technology and sustainability. Our panel of 11 distinguished speakers features Dr Chow-Yang Lee, Dr Stephen L. Doggett, Dr Chin-Cheng Yang, Dr Wan Fatma Zuharah, Dr. Veera Singham K. Genasan, Dr Khoirul Himmi Setiawan and Dr Chong-Chin Heo, among many others.

Stay tuned for more information coming soon. In the meantime, please email contactus@spma.org.sg for any correspondence. **See also conference flyer on Page 33**. ■

PHILIPPINES: NEWS FROM THE PEAP

Provided by The Pest Exterminators Association of the Philippines

The Pest Exterminators Association of the Philippines (PEAP) recently held their 4th National Convention. 11-13th November, 2018 at Zen Garden Hotel in Tagaytay City. The theme being, "Taking the Leap of Transformational Challenges." This conference is held every two years to foster friendship, educate, and to build up and renew the commitment of members as part of their social obligations for a healthier and pest- free Philippines.

Attendees at the recent PEAP meeting

PEAP President, Job B. Dayandante, stressed that we do not simply act as a rider or follower on the waves of change. As an association, we should take the lead of not only promoting the culture of pride within the organization, but humbly adopt the so called professional confidence to serve and be responsive to the needs of our fellow exterminators. This is by sharing the era of advanced technology, transparency and joint development with our partners in the Global Industry such as the Pest Control Association of the Philippines (PCAP) and the Federation of Asian & Oceania

PEAP National Convention: LEADS EH Executive Vice President Ms. Catherine M. Baisas (third form left) cuts the ceremonial ribbon with PEAP President Job B. Dayandante (third from right) to open the 4th National Convention of Pest Exterminators Association of the Philippines (PEAP) at ZEN GARDEN Tagaytay Hotel & Event Center recently. With the theme: "Taking the Leap of Transformational Challenges" the event, sponsored by LEADS Environmental Health and MACODYN, Inc. was staged to further professionalize techniques, methodologies and strategies of modern Pest Control in the country. With them are (from right) Dir. Norma Salazar of and NATCON Chairman Mr. Danilo Magpantay. (from left) IPP Ms. Vergie Jawid and Dir. Terry Villegas of MACODYN, INC. At the back (form left to right) Mr. Daniel Verdejo of Upgreen Corporation, Dir. Teddy Dela Cruz, Dir. Baby Lopez, Dir. Angie Roa Yu and Dir. Clark De Paz.

Pest Managers Associations (FAOPMA). As Fernando "Erdie" Malveda, PEAP Founding member, CEO and President of LEADS Environmental Health Products Corp. once said, that whoever wishes to lead the Association should continue the spirit of service above and beyond personal interests and gain.

The National Convention, Chair Danilo L. Magpantay, together with Job B. Dayandante, expressed their gratitude for the tremendous support given by the major sponsor, LEADS EH through their Executive Vice President, Catherine M. Baisas, and the minor sponsor MACODYN Inc. through their, President Theresa N. Villegas. The support of all associate members of PEAP where acknowledged for the many initiatives that have taken place during the committee meetings, thus making the event a huge success.

There are many challenges that need to be considered when it comes to pest control. The speakers in the programme were uniquely placed to highlight key trends and current practices of the Industry. Catherine M. Baisas, who served as a speaker during the FAOPMA-Pest Summit convention held in China during September 2018 and the Executive Vice President of LEADS EHPC were some of the resource speakers. They discussed the sales management challenges facing pest control operators today.

Ian Paul de Lara, a digital marketing strategist, presented on Digital Business Management as it relates to pest control business management.

The event was filled with fruitful discussions, the sharing of information, and live entertainment. The meeting culminated with the election of a New Board of Directors and Executive Officers for the ensuing years, 2019 -2020.

The oath taking ceremony was held at Richmonde Hotel in Quezon City, simultaneous with the PEAP Christmas Party on December 4, 2018. ■

CHINA: NEWS FROM THE CPCA

Provided by the Chinese Pest Control Association

Congratulations to Mdm Huang Xaioyun, President of FAOPMA, for winning the inaugural Excellence in Pest Management Award sponsored by Bayer. The award was presented at the recent FAOPMA-Pest Summit held in Shenzhen, China.

See bottom right of Page 14 for an image of Mdm Huang receiving the award.

Mdm Huang also received the Global Ambassador Award from the National Pest Management Association of the USA, for her services to the global pest management industry. The award was received at the recent PestWorld meeting held in Orlando during November 2018.

In April 2019, the Chinese Pest Control Association's (CPCA) Annual Conference will be held in Nanchang, Jiangxi, China. More than 1,000 delegates will attend the meeting with 100 exhibitors participating in the event.

On 6th June 2019, the CPCA will organize events nationwide to raise the profile of the pest control industry. Participating on the day will include professionals from the pest control industry, the media, celebrities, and people from all walks of life. Various promotional events will be held through television, social media, billboards at public transportation, community bulletin boards and other venues. ■

Stephen L. Doggett

NEW ZEALAND: NEWS FROM THE PMANZ

Provided by Peter Barry, Pest Management Association of New Zealand.

The PMANZ congratulates Flick Anticimex as winner of the Fiji Business Excellence Award for 2018. They have won this award annually since 2013, when they were then Amalgamated Pest Control.

This is a wonderful achievement, and one which the company can be proud of. PMANZ sends their best wishes to the team in Fiji for the New Year!

PMANZ will be holding their biennial meeting over 22-23 August 2019 at the Waipuna Hotel and Conference Centre in Auckland. **See flyer on Page 39**.

HEALTH AND SAFETY ALERT – CATS, PYRETHRINS AND SYNTHETIC PYRETHROIDS (PERMETHRIN)

PMANZ have had a number of reports of cats dying from unknown causes, coincidently shortly after pest control treatments have been carried out for spiders and/or ants.

The owners have alleged that the technician's treatment caused the death of their beloved pet. In all cases synthetic pyrethroids (SPs) were used, begging the questions did the cats come into contact with wet spray or dust?

The one report received from a veterinarian indicated, "She [the cat] presented with generalised body tremors, sneezing and paw flicking. One of the possible causes for this presentation is pyrethroid toxicity. There was a history of the house recently being sprayed with a pyrethrum based ant spray".

Regrettably, we will never know for sure as laboratory detection of pyrethroids is not readily available and haematology, biochemistry and other findings, might be normal.

Synthetic Pyrethroid sprays eliminate a wide range of insects and can be highly effective; however, they can be very toxic to cats if they come into contact with the wet spray. Some additional information follows that may help provide a better understanding of this potentially unique problem that initially manifested itself with common 'spot-on' flea treatments.

PYRETHRUM, PYRETHRINS AND PYRETHROIDS

Pyrethrum is the natural extract from the flowers of *Chrysanthemum cinerariaefolium* (Dalmation pyrethrum daisy). The six active insecticidal compounds of pyrethrum are called pyrethrins. They are pyrethrin I, pyrethrin II, cinerin I, cinerin II, jasmolin I, and jasmolin II.

Pyrethrum or the pyrethrins represent much less of a risk than synthetic pyrethroids, mainly because they are seldom used in urban pest management, but also because they degrade so rapidly that most of the active ingredient has disappeared within five hours after application, if applied during day light hours.

The pyrethroids are synthetic analogues of the original pyrethrins and comprise hundreds of derived compounds. Relatively few of these have been developed commercially. Permethrin is a SP widely used in flea control products for small animals, mainly dogs. Accidental toxicity can occur with off-label usage, and cats are particularly susceptible.

Although they are based on the chemical structure and biological activity of the pyrethrins, the development of synthetic pyrethroids has involved modifications that make these compounds more toxic and less degradable in the environment than pyrethrins.

It is permethrin that represents most risk to cats due to the persistence of the insecticide. However, all SPs should be considered hazardous to cats.

AUSTRALIAN PESTICIDES AND VETERINARY MEDICINES AUTHORITY (APVMA)

The APVMA had this to say on pyrethrin and pyrethroid use on cats (extract)

https://apvma.gov.au/node/19176

The APVMA has received enquiries about exposure of cats to insecticide products containing pyrethrin and the potential for pyrethrin-toxicity following exposure.

There are nearly 200 insecticidal products containing pyrethrins registered for use in Australia, including powders, sprays, and shampoos. Of these, around 50 are registered for use on cats.

GENERAL INFORMATION AND GUIDANCE

Pyrethrins are insecticidal substances produced from the *Chrysanthemum cinerariaefolium* flower that may be toxic to cats at high concentrations

Pyrethroids, including permethrin, are synthetic forms of pyrethrins that are toxic to cats at high concentrations

TOXICITY

Pyrethrins are insecticidal substances produced from the flower head of the pyrethrum plant, *Chrysanthemum cineraiaefolium*. Pyrethrins rapidly knock down, paralyze and kill insects by disrupting nerve function.

Pyrethroids are synthetic analogues and derivatives of pyrethrins, which have undergone extensive chemical modifications to make them more toxic to insects, with a greater knockdown effect than the plant pyrethrins.

WHAT IS THE TOXICITY OF PYRETHRINS AND PYRETHROIDS?

The toxicity among the various pyrethrins and pyrethroids varies greatly, which is reflected in the wide range of LD_{50} concentrations— LD_{50} is the dose at which 50 per cent mortality is observed in exposed laboratory animals.

Generally, pyrethrins are less toxic to mammals than pyrethroids and the toxicity of pyrethroids varies depending on the type of pyrethroids (isomer ratio), as well as factors such as the type of formulation.

The primary target of acute pyrethrin, or pyrethroid, induced toxicity appears to be the nervous system. In cats exposed to high concentrations of permethrin, clinical signs such as hyperexciteability, depression, vomiting, excessive salivation, muscle tremors, not eating, seizures, convulsions, lack of coordination and death, have been observed within minutes or days after treatment.

PERMETHRIN TOXICITY IN CATS: A RETROSPECTIVE STUDY

From a retrospective study of 20 cases of permethrin toxicity in cats treated at an emergency clinic in Brisbane, Queensland (Australia) from October 2004 to June 2005, the following became evident:

The diagnosis of permethrin toxicity was made on the basis of a history of exposure and characteristic clinical signs, including seizures, muscle fasciculations, and tremors. Decontamination and appropriate seizure or muscle fasciculation control were the basis of treatment.

The outcome was good after rapid intervention and 19 of the 20 cats were successfully treated, with the only death occurring in a kitten for which treatment was delayed for 24 h. No long-term complications were reported by the cat owners at 4-month follow-up after discharge from hospital.

Source: https://www.ncbi.nlm.nih.gov/pubmed/18498556

IMPACT ON CATS

Synthetic pyrethroids are metabolised by mammals and birds in the liver, and cats have different liver metabolic pathways to other animal species (they are deficient in hepatic glucuronosyltransferase enzyme) leading to a poor ability to break down SP's.

Cats lack the ability to metabolize SP's when they come into contact with them through their skin or when they lick them off of their fur while grooming, according to the Veterinary Support Personnel Network.

This makes them highly toxic to cats and they should never be applied to their skin or to an area where they might encounter exposure.

Signs of poisoning in cats include seizures, tremors and muscle spasms, usually appearing within 48 hours of exposure to the toxin, according to the ASPCA (American Society for the Prevention of Cruelty to Animals) National Animal Poison Control Centre.

Scholarly articles on cat poisoning with permethrin show that much of the occurrence is due to dog flea treatments (permethrin shampoos and powders) being used to treat cats rather than poisoning due to pest management treatments.

RECOMMENDED TREATMENT PROCEDURES FOR HOMES WITH CATS

Prior to spraying, notify neighbours and get your client to bring their feline friends indoors to prevent them from getting the spray on their fur.

Before spraying with SP's inside or around a home, the PMANZ suggests:

- Ask the owner if they have cats and to bring them inside, and close the windows to the rooms where they are and not let them out until the insecticide is dry.
- Get your customer to speak with their neighbours to let them know when and where you'll be spraying so they can keep their cats indoors as well.
- If spraying indoors for fleas, the cat should be removed off-site to a cattery until treatment is complete and surfaces and carpets are dry.
- Lift all food and drink bowls off the floor or cover with suitable non porous material
- Keep cats away from wet spray until dry. This may take longer in wet weather.
- Use the four hour stand-down rule for flea and other spray treatments, but insist that the owner make sure carpeting is dry before allowing cats onto them.
- Once the insecticide is dry, it's safe for kitties to come out again. Use alternative insecticides when treating homes where cats are present.

THE SIGNS OF PYRETHRIN OR PYRETHROID TOXICITY IN CATS

If you suspect your customer's cat or kitten has encountered an SP spray while outdoors, wash the skin and fur with dish soap to remove as much of the toxin as possible. After washing, bring the cat to a veterinarian for treatment immediately. Quick treatment can prevent a possible tragedy.

Cats that have been exposed to a large amount of pyrethrin/pyrethroid-based insecticides will often have whole-body tremors. Other signs often include:

- Excessive salivation/drooling
- Agitation or restlessness
- Vomiting, Loss of coordination
- Difficulty jumping, standing or walking
- Shaking, twitching, muscle tremors (often mistaken for seizures), Difficulty breathing

If left untreated, pyrethroid toxicity can be fatal to cats.

CLINICAL SIGNS AND DIAGNOSIS

Clinical signs are normally noticed immediately after exposure, but can be delayed for up to 72 hours. In mild exposures, paraesthesia induced by direct contact with the substance may result in paw flicking, ear twitching and uncontrolled contractions of the cutaneous trunk muscles.

Grooming of a contaminated body area can result in hyper salivation and vomiting. Severe muscle tremors, seizures and/or depression are normally seen only in severe intoxications.

Laboratory detection of pyrethroids is not readily available and haematology, biochemistry and other findings might be normal.

One of the principal differential diagnoses is organophosphate/carbamate toxicoses.

Where available, measurement of cholinesterase levels may be helpful in distinguishing between the two groups of toxins — with levels being unremarkable in pyrethroid toxicity and most likely decreased in organophosphate toxicity.

TREATMENT AND PROGNOSIS

Dermal decontamination should be instituted at the earliest possible opportunity. Bathing of the pet is generally useful and the use of a hand- or dishwashing detergent might enhance the cleaning process.

Hypothermia may potentiate the effect of pyrethroids on ion-channel activity and, therefore, bathing the pet with cold water and/or prolonged sedation should be avoided.

Conversely, bathing in water that is too warm might enhance resorption through the skin due to hyperaemia and should also be avoided. The pet should be actively dried and, if transport to a veterinary facility is delayed, owners can be advised to wrap it in a warm towel. ■

PMANZ 2019 Biennial Conference and AGM

Where: Waipuna Hotel and Conference Centre, Auckland
When: 22nd – 23rd August 2019
Be there...

COME HEAR FROM

Robert (Bobby) Corrigan, PhD, Urban Rodentologist, RMC Pest Management Consulting

Bobby has been active in the science of urban pest management for over 25 years. He serves a consultant who specializes in rodent pest management programs on a national and international scale and also as a part time research scientist with The City of New York's Department of Health.

Cor Vink PhD, MSc, Curator Natural History, Canterbury University.

Cor's main research interest is the systematics and taxonomy of New Zealand spiders, but he also worked on spider ecology, biosecurity and biological control. Cor is an Adjunct Senior Lecturer in the Ecology Department at Lincoln University.

Helen Blackie, PhD, MSc, Boffa Miskell, Biosecurity Consultant, Principal Auckland

Prior to joining Boffa Miskell in 2014, Helen was Associate Director at the Centre for Wildlife Management and Conservation (Lincoln University), where she led a nationwide team of experts in engineering, creative design, animal behaviour, toxicology and ecology.

David Lilly, PhD, MEnt, Principal Entomologist, Ecolab Global Pest Elimination – RD&E

David is responsible for developing and supporting innovative pest management solutions for the larger Pest Elimination division. I have 15 years' experience in urban pest management, including both the auditing and/or development of tailored pest management solutions, and providing qualified technical support to high-needs customers.

Registrations Open 1st March 2019 - https://www.pmanz.nz/2019-conference-and-agm.html

News Items

A Compendium of Pest Management News Items from the Media Relevant to FAOPMA Member Countries

Compiled by Stephen L. Doggett and David Lilly

India: Outbreak of Japanese encephalitis in Maharashtra (20/Dec/2018)

Over the last eleven months, the Maharashtra district of India has recorded 108 cases of the mosquito-borne viral disease, Japanese encephalitis. In comparison, 2017 recorded only 30 cases. (SLD: Japanese encephalitis virus is a potential fatal mosquito-borne disease largely transmitted via various *Culex* mosquitoes. Fatality rates are up to 30% in those that develop clinical illness and around 30% of the survivors will have permanent neurological damage. Prevention is via vaccination, vector control, and vector avoidance.)

Source: *ProMED Digest, Vol. 78(58)*.

CHINA: USING COCKROACHES TO CONTROL WASTE (10/DEC/2018)

With the ever growing world population, China is employing an innovative solution to rid its cities of food wastes; feed this to cockroaches. According to a news story in Reuters, "a billion cockroaches are being fed with 50 tons of kitchen waste a day" in the city of Jinan. The cockroaches will be used as a protein source for livestock, and are being investigated for use in "beauty masks, diet pills and even hair-loss treatments". (SLD: certainly an innovative solution to reducing China's waste. It is a great pity that there was not a discussion on how the cockroach allergens are being managed, particularly as they are a major trigger of human respiratory diseases.)

Source: *Reuters*, https://www.reuters.com/article/us-china-cockroaches/bug-business-cockroaches-corralled-by-the-millions-in-china-to-crunch-waste-idUSKBN1O90PX

USA: INVASIVE TICK (1/DEC/2018)

A new tick species that is known to transmit a wide range of pathogens has been identified in the United States, in the New Jersey region. The species, *Haemaphysalis longicornis* (also known as the 'Asian long horned tick') is indigenous to China, Japan, eastern Russia, and Korea, and was previously introduced into Australia and New Zealand, presumably via cattle. (SLD: invasive species, such as this tick, is a salient reminder for the need for appropriate quarantine procedures to keep all of our nations free of exotics.)

Source: *ProMED Digest, Vol. 78(1)*.

USA (AND THE WORLD): NATIONAL CLIMATE ASSESSMENT (27/NOV/2018)

In spite of several ignorant world leaders and the gross polluters of the world, Climate Change and Global Warming is an undeniable fact. No matter how Climate Change is reported, the news is very depressing and the world will alter in ways in which we can only guess at. In a recent report from the US Government, the impacts of Climate Change on the nation are presented and tells of a very depressing scenario. In relation to pests and vectors of disease, it is predicted that the distribution and geographic range of vector-borne diseases will alter dramatically, exposing more people to these conditions. The areas of the US most vulnerable will be the regions in the south. The report recommends that strategies must be implemented to prepare communities for the effects of Climate Change. (SLD: sadly Climate Change seems like an unstoppable train and the world is standing on the tracks. With so many nations lead by older conservative politicians who deny the body of evidence from climate experts, the hope for the future of generations to come after us seems bleak.)

"in recent years there has been huge progress in reducing the number of cases of malaria, sadly the decline has stalled"

Source: https://nca2018.globalchange.gov/

ASIA: DENGUE UPDATE (24/NOV/2018)

Bangladesh – up to 23/Nov there have been 9,531 dengue cases in 2018, the highest in 18 years.

India – more than 31,500 cases have been reported during 2018. The hardest hit regions have been the Punjab (around 12,000 cases), New Dehli (~7,360 cases), and Maharashtra (2,000 cases).

Malaysia – a total of 62,974 cases have been reported during the period of 1 Jan to 3 Nov 2018, with 108 deaths. This is a decrease from 2017.

Nepal – 81 cases of dengue were reported from Kathmandu, Pokhara, and Syangja.

Pakistan – there have been over 2,100 confirmed cases of dengue virus disease for 2018.

Philippines – over 5,700 cases have been reported with deaths.

Taiwan – some 208 dengue cases have been reported for 2018.

Thailand – to 29/Oct for 2018 there were 70,146 cases of dengue with 126 deaths. The regions of Nakornpathom, Phichit, Nakornsawan, Nakornnayok, and Chiengrai, have the highest rates of disease.

(SLD: with almost 200,000 cases for 2018, these figures are truly horrifying for the Asian and Indian regions. Dengue is a mosquito-borne virus transmitted by the mosquito *Aedes aegypti*. There are four types of dengue, classified into different serotypes (serotypes 1 to 4). Infection with multiple serotypes increases the risk of the more serious complications of dengue, notably dengue haemorrhagic fever and dengue shock syndrome, which may lead to death. Mosquito control is the main means of controlling dengue transmission.)

Source: *ProMED Digest, Vol. 77(81)*.

NEPAL: TICK-BITE FEVER (23/NOV/2018)

A previously healthy 57-year-old man presented to Outpatients in Nepal with fever, headache, fatigue, and various neurological symptoms. He also developed a red patch on his skin that gradually expanded and was similar in appearance to Erythema Migrans, a symptom of Lyme disease. He was treated with antibiotics. Patients presenting with similar symptoms have been on the increase in recent months in Nepal and all respond well to antibiotic therapy. (SLD: Lyme disease is a tick-borne disease typically transmitted by black-legged ticks belonging to the genus, *Ixodes*. The disease is characterised by three stages; rashes, neurological issues, and arthritis. Treatment outcome is positive, especially if treated early. Tick-bite avoidance, such as the use of topical repellents or permethrin treated clothing, are the main mean of preventing the disease.)

Source: ProMED Digest, Vol. 77(76).

DON'T MESS WITH THIS RAT! (22/NOV/2018)

Perhaps the toughest rat on the planet, watch as it chases a cat!

Source: *YouTube*, https://www.youtube.com/watch?v=_IAWmBcqDWQ

INDIA: KYASANUR FOREST DISEASE (21/NOV/2018)

In a recent meeting at a Community Health Centre at Valpoi, health officials stressed the need for both short and long term strategies to halt the spread of Kyasanur Forest disease (KFD) in parts of India. In 2017, 57 patients tested positive for the disease. (SLD: KFD is a virus spread via ticks, such as *Haemaphysalis spinigera*. Symptoms include chills, fevers, and headaches. This may develop into severe muscle pain, vomiting, and even bleeding. Around 5% of cases prove to be fatal. Tick-bite avoidance, such as the use of topical repellents or permethrin treated clothing, are the main mean of preventing the disease.)

Source: ProMED Digest, Vol. 76(46).

WORLD MALARIA REPORT, 2018 (19/NOV/2018)

The World Health Organization has just released its annual report on the world malaria situation. While in recent years there has been huge progress in reducing the number of cases of malaria, sadly the decline has stalled. There were an estimated 219 million cases and 435 000 related deaths in 2017. Sub-Saharan Africa was home to 90% of the malaria cases and 91% of malaria deaths. More than two thirds (70%) of all malaria deaths occur in children under the age of five.

Region	Estimated malaria cases (2017)
Africa	200 million
South East Asia	11.3 million
Eastern Mediterranean	4.4 million
Western Pacific	1.9 million
Americas	1 million
Europe	0

Source: http://www.who.int/malaria/publications/world-malaria-report-2018/en/

INDIA: CHIKUNGUNYA VIRUS UPDATE (12/NOV/2018)

Chikungunya virus (CHIKV) cases have surpassed 1,000 with Jabapur being the hardest hit. The vector for CHIKV is the same as dengue, *Aedes aegypti*. People with CHIKV suffer pain in the joints and muscles, and patients may take some months to recover fully. (SLD: CHIKV is a mosquito-borne disease. Historically CHIKV was a relatively minor risk, however in 2005 the virus evolved and a single change on the viral genome resulted in two things; the virus could be rapidly transmitted, and transmitted by different mosquitoes. The result was a massive outbreak in Reunion Island with some 260K cases and 250 deaths. The highly pathogenic strain then spread throughout the world to India, Asia, Africa, and Europe, resulting in more than 3,000,000 cases).

Source: ProMED Digest, Vol. 77(45).

MALAYSIA: RISE IN MACAQUE MALARIA AND IMPLICATIONS FOR HUMAN HEALTH (8/NOV/2018)

There has been a spike in monkey malaria cases over the last ten years. The malaria parasites of monkeys (*Plasmodium knowlesi* and *P. cynomolgi*) can also affect humans, and thus increase in these types of malaria have implications for human health. Local health authorities are suggesting that this is due to an increase in testing of monkeys, however

researchers from the London School of Hygiene and Tropical Medicine suggest the increase is tied to rapid deforestation, where land is being cleared for oil palm plantations. The land clearing increases the chance of humans becoming infected, especially those working in forest related industries. The local Ministry of Health is encouraging employers to provide treated bed nets and repellents to their workers. Note that *P. knowlesi* made up 57% of malaria cases in 2013.

Source: ProMED Digest, Vol. 77(34).

INDONESIA: JAPANESE ENCEPHALITIS OUTBREAK (7/NOV/2018)

Currently there is an outbreak of the potentially deadly Japanese encephalitis virus in Bali and Manado, in North Sulawesi. According to the Ministry of Health, Bali has had the majority of cases. In response to the activity, vaccinations against the virus are being introduced to the affected areas to prevent further transmission.

Source: ProMED Digest, Vol. 76(19).

INDIA: JAPANESE ENCEPHALITIS ACTIVITY (7/NOV/2018)

In spite of some success in reducing the number of Japanese encephalitis cases in India (see news item below). Assam has topped the list of the most number of cases at a national level with the loss of 94 lives and 488 cases. The main issue appears to be a lack of adult vaccination in some of the regions and a low uptake in others.

Source: ProMED Digest, Vol. 76(19).

ASIA: ZIKA VIRUS ACTIVITY (6/NOV/2018)

Taiwan issues travel alert after a 30 year old male was diagnosed with Zika virus after travelling to Vietnam, https://www.telegraph.co.uk/news/2018/10/04/taiwan-issues-travel-alert-case-zika-imported-country/

In Thailand, a pregnant women infected with Zika virus had her foetus develop microcephaly, https://wwwnc.cdc.gov/eid/article/24/9/18-0416_article

Some 153 people from the Madhya Pradesh region of India became infected with Zika virus, with 50 of these being pregnant women. This is region known to have major mosquito breeding problems, https://scroll.in/latest/900564/centre-sends-health-experts-to-madhya-pradesh-to-verify-reports-of-zika-infection

China receives it first imported case of Zika virus for 2018, the male patient having recently travelled to the Maldives, http://www.xinhuanet.com/english/2018-10/23/c_137552834.htm

(SLD: Zika virus is spread through the bite of mosquitoes, notably *Aedes aegypti*. Most infections are subclinical (meaning there is no disease). Symptoms of the disease are generally quite mild and may include fever, rash, joint pain, headaches, conjunctivitis (red eyes), and malaise (feeling of weakness and a lack of energy). In pregnant women, infection with the virus can be serious for the developing baby and may lead to abnormalities such as microcephaly (small head and brain). Avoidance of Zika virus active areas, the use of repellents, and vector control measures are all ways to minimise the risk of disease.)

Source: ProMED Digest, Vol. 77(22).

NEPAL: SCRUB TYPHUS OUTBREAK (6/NOV/2018)

Following the severe earthquakes that hit Nepal in 2015, there was a major outbreak of scrub typhus with 101 cases reported in 2015 and 8 fatalities. At the time, this was the most severe outbreak to date. However, cases continued to climb with 831 cases in 2016 and 14 deaths. For 2017-2018, there have been 1,435 reports of human infection with a further 10 fatalities. The link between human cases and earthquakes, is that many people became homeless forcing them to live in temporary shelters with high rodent numbers.

(SLD: scrub typhus is a rickettsial disease spread via chigger mites to humans. The mites acquire the bacteria from rodents, notably certain mice species. The disease is readily treated with antibiotics but the supply of drugs to patients in impoverished nations following disasters is challenging. Avoiding the bites of the mite is the main means of preventing the disease. The use of personal repellents and the wearing of impregnated permethrin-treated clothing is advisable in high risk areas.)

Source: ProMED Digest, Vol. 76(12).

AUSTRALIA: BED BUGS RUIN HONEYMOON (5/NOV/2018)

Two newlyweds travelling in remote regions of Australia via camper trailer found themselves covered in insect bites. In spite of using a range of repellents, insecticides and other control measures in their camper trailer, the bites never went away. Subsequently bed bugs were identified, and the holiday (and camper trailer) abandoned to avoid the ongoing discomfort of the bites.

(SLD: note that the insect depicted in the article is an isopod (a common slater) and not a bed bug, and that much of the advice is not accurate.)

Source: Unsealed4x4 Magazine (issue 055), http://unsealed4x4.com.au/u4x4/issue055/?utm_source=ActiveCampaign&utm_medium=email&utm_content=Beg+bugs+ruined+my+trip+around+Australia&utm_campaign=Unsealed+4X4+055+-+Send+4#149

AUSTRALIA: FURTHER BANS FOR CHLORPYRIFOS? (30/OCT/2018)

Chlorpyrifos is an organophosphate that has been widely used in the field of urban and agricultural pest control for the management of a range of insects. The insecticide is still used in many countries today. Some recent studies have suggested that exposure to chlorpyrifos can lead to brain damage in unborn children. As a result, a number of countries have banned the use of this insecticide. Now the Australian regulator, the APVMA (Australian Pesticide and Veterinary Medicines Authority) is reviewing the registration of this insecticide.

Source: *ABC online*, https://www.abc.net.au/news/2018-10-31/chlorpyrifos-apvma-review-delay/10450498

FRANCE: PESTICIDE POISONING OF FARM WORKERS (28/OCT/2018)

Dozens of people fell ill after consuming lettuce contaminated with the insecticide, metam sodium. This organo sulphur compound is used in the agricultural industry to protect plants against a range of insect pests. However, it

is not meant to be applied directly to plants, rather to the ground surface only. Symptoms of poisoning include burning eyes and respiratory issues, and 17 people had to be hospitalized during this incidence. Metam sodium is considered a probable human carcinogen by the United States Environmental Protection Agency. This is not the first reported incidence of poisoning from metam sodium and highlights the need for product labels to be fully read and insecticides applied as per label directions.

Source: *ProMED Digest, Vol. 75(72)*.

PROPOSAL TO BAN ALL ORGANOPHOSPHATES TO PROTECT CHILDREN'S HEALTH (24/OCT/2018)

A group of researchers from the US have made a recommendation that all insecticides belonging to the organophosphates (OPs) should be banned. They claim that prenatal exposure (i.e. prior to the child being born) at low levels increases the risk of cognitive, behavioural, and neurodevelopmental disorders, and can result in reduced IQ levels. Furthermore, at high level exposure to the OPs more than 200,000 people die every year, including 110,000 suicides. Most of these deaths are in developing nations. According to the report, there is no safe level of organophosphate exposure for children.

Source: *Plos Medicine*, https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002671

PAKISTAN: CRIMEAN-CONGO HAEMORRHAGIC FEVER ACTIVITY (22/SEP/2018)

Crimean-Congo Haemorrhagic Fever (CCHF) is a deadly tick-borne viral disease that can induce uncontrolled bleeding, with fatality rates as high as 50%. Fourteen cases of CCHF have been admitted to the Jinnah Postgraduate Medical Centre in Karachi, with ten deaths for the region. (SLD: avoidance of tick bites is the main means of preventing the disease. This can include the use of topical repellents, such as those containing DEET or picaridin, the wearing of permethrin-impregnated clothing, and avoiding areas endemic for the disease).

Update 11/Nov/2018: since 2015 there have 613 people in Pakistan infected with CCHF including 148 deaths. Balochistan include teh worst hit areas with 424 infections.

Source: *ProMED Digest, Vol 75(72) & Vol 77(42)*.

CHINA: RESTAURANT'S SPECIAL SECRET INGREDIENT: DEAD RAT! (10/SEP/2018)

A diner at a restaurant in Weifang, Shandong province, China, found a special ingredient that was a bit hard to chew; a dead rat. The diner was a pregnant women and it was alleged that the restaurant staff offered to pay the husband 20,000 yuan (USD$3,000) for an abortion! Compensation was paid and the women subsequently went through a series of medical checks. Authorities immediately suspended the licence of the restaurant until procedures are improved.

Source: *South China Morning Post*, https://www.scmp.com/news/china/society/article/2163524/rat-hot-pot-shocks-pregnant-woman-shuts-down-restaurant-eastern#cHXXLShb4sWFLICR.41

MALAYSIA: BED BUGS AT THE MOVIES (8/SEP/2018)

A couple, recently claimed they were bitten by bed bugs while at a cinema in Petaling Jaya, Malaysia. The company concerned has reimbursed medical expenses and initiated immediate control measures. They will also ensure that pest are monitored for on a regular basis. (SLD: with the global bed bug resurgence virtually any location can become infested with bed bugs. I personally have attended a number of infestations in cinema complexes and such infestations are challenging to control. During the 1920's and 30's, bed bugs and human fleas, were common in picture theatres).

Source: *Star Online*, https://www.thestar.com.my/news/nation/2018/09/08/gsc-compensates-bed-bug-couple-promises-immediate-clean-up/

INDIA: SUCCESS! REDUCTION IN JAPANESE ENCEPHALITIS CASES (6/SEP/2018)

There has been a dramatic decline in the number of Japanese Encephalitis virus (JEV) cases in India during 2018. Up to early August there were 1,427 cases with 111 deaths compared with over 5,400 cases and 748 deaths in 2017. The successes were attributed to a multi-facet effort including mass vaccination, sanitation drives to reduce vector breeding, and reducing malnourishment in high risk groups.

Source: *ProMED Digest, Vol 74(15)*.

AUSTRALIA & ASIA: $50 MILLION FUNDING TO COMBAT MOSQUITO-BORNE DISEASES (28/AUG/2018)

A program that employs *Wolbachia* infected mosquitoes to combat dengue transmission in *Aedes aegypti*, received a funding boost of $50 million to combat diseases spread by this mosquito. The World Mosquito Program successfully introduced *Wolbachia* infected *Aedes aegypti* into the field in northern Australia, halting the local transmission of dengue virus. The program has now spread to other areas of the world including Yogyakarta in Indonesia and Vietnam. (SLD: *Wolbachia* is an intracellular bacteria that is occurs in most insect species. In *Aedes aegypti* it prevents viral replication and shortens the life of the mosquito. Once introduced into an area, the *Wolbachia* infected mosquitoes eventually replaces the wild mosquitoes, thereby halting virus transmission.)

Source: *Twitter*, https://twitter.com/trevormundel/status/1034252623581347841 ■

Stephen L. Doggett

News from Academia

A Compendium of New Scientific Publications Relevant to the Pest Management Industry

Compiled by Stephen L. Doggett and David Lilly

India: Insecticide Resistance of Mosquito Vectors

Japanese encephalitis virus is a potentially fatal mosquito-borne disease that occurs throughout regions of south-east Asia to the subcontinent. The main mosquito vectors all belong to the *Culex* genus, and includes *Culex vishnui*, *Culex tritaeniorhynchus* and *Culex bitaeniorhynchus* in India. Investigations into insecticide susceptibility with these mosquitoes has shown that *Culex vishnui* and *Culex tritaeniorhynchus* are resistant to DDT, malathion and deltamethrin, while *Culex bitaeniorhynchus* was susceptible to all these compounds. Such information is important to ensure the most appropriate chemicals are used in the management of these import vectors of arboviral disease.

Source: *Medical and Veterinary Entomology* (18/Dec/2018), https://onlinelibrary.wiley.com/doi/10.1111/mve.12352

REPELLING BED BUGS? FORGET USING DEET WITH MODERN BED BUGS!

Repellents such as N,N-diethyl-m-toluamide (DEET) have longed been successfully employed to prevent the bites of blood sucking insects such as mosquitoes. With so many insecticides that are ineffectual at controlling modern insecticide resistance bed bugs strains, researchers are looking at using repellents to stop bed bugs from biting, which could lead to the eradication of infestations. However, investigators from Argentina found that DEET was less effective at repelling insecticide resistant strains than susceptible strains of the common bed bug, *Cimex lectularius*. As most field strains are of the resistant variety, perhaps repellents will have little benefit in preventing the bites of these insects.

Source: *Journal of Economic Entomology* (14/Dec/2018), https://academic.oup.com/jee/advance-article/doi/10.1093/jee/toy387/5253326

INDONESIA: MOSQUITO COILS LESS EFFECTIVE DUE TO RESISTANCE

With a limited arsenal of insecticides available to control adult mosquitoes, the development of insecticide resistance is to be expected. Insecticide resistance in *Aedes aegypti*, the primary vector of Dengue virus, has been well documented to a range of insecticide classes, but especially with the pyrethroids. A group of researchers from Indonesia monitored a range of field strains for their ability to be controlled by pyrethroid based mosquito coils. In a number of regions, field strains were found highly resistant, with mosquito coils producing a kill rate of less than 80%, however strains from other regions were effectively controlled. The ongoing monitoring of insecticide resistance is important in advising the populace on the most effect means of adult mosquito management.

Source: *Journal of Economic Entomology* (14/Dec/2018), https://academic.oup.com/jee/article-abstract/111/6/2854/5108461?redirectedFrom=fulltext

HOW MOSQUITOES FIND GAPS IN NETS

We all know that bed nets and screens are an effective means of preventing mosquito bites and the diseases they carry, however if there are holes in the netting, then mosquitoes can pass through them. But how much of a risk do the holes pose? This is the question posed by researchers from the University of Central Florida and thus they evaluated the potential for mosquitoes to fly through holes. Their results were quite interesting in that mosquito tend to fly at nets quite randomly and tend to fly repeatedly at the same spot. They tend not to walk over the net and it is shear random chance that they will pass through. Thus even if there are small holes in the net, the net will still provide some protection against mosquitoes.

Source: *Entomology Today* (7/Dec/2018), https://entomologytoday.org/2018/12/05/hole-story-how-mosquitoes-seek-gaps-nets-screens/

SINGAPORE: MODELLING THE EFFECTS OF RAINFALL ON DENGUE TRANSMISSION

Mosquitoes require water for the larval stage to develop and rainfall is a good predictor of mosquito and mosquito-borne

disease activity. However, too much rainfall can flush larvae out of their habitat. In a better effort to predict dengue virus activity, researchers have developed models to evaluate the flushing effects on dengue activity in Singapore. They noticed that dengue outbreaks reduced in number one to six weeks after rainfall flushing events. Such models, if proven to have a high degree of accuracy, should help to better manage resources to control disease outbreaks.

Source: *PLoS Neglected Tropical Diseases* (6/Dec/2018), https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0006935

INDIA: TESTING PATIENTS FOR ALLERGIES TO MITES

A study from India recently published in the *Journal of Medical Entomology*, tested patients with allergies (notably allergic rhinitis), to see if they were hypersensitive to dust mites and stored product mites. Some 330 of 372 patients were found to be allergic to allergens associated with these mites, and most patients were sensitive to multiple allergens. (SLD: the allergens from dust mites, such as the faeces and cuticular particles, have been long known to trigger various allergic reactions and even asthma in humans. Controlling the mites is important to reduce potential adverse health impacts.)

Source: *Journal of Medical Entomology* (20/Nov/2018), https://academic.oup.com/jme/advance-article-abstract/doi/10.1093/jme/tjy206/5193814?redirectedFrom=fulltext

SMELLY COCKROACH HOMES: CONTROLLING ROACHES IN SEWERS

The American cockroach, *Periplaneta americana*, is renowned for producing allergens that can trigger human respiratory illnesses. One of its favoured habitats is human sewers. A recent review has highlighted the challenges of controlling this species in human sewerage systems and recommends that an IPM approach is undertaken.

Source: *Journal of Medical Entomology* (20/Nov/2018), https://academic.oup.com/jme/advance-article-abstract/doi/10.1093/jme/tjy205/5193762?redirectedFrom=fulltext

INDONESIA: INSECTICIDE RESISTANCE IN *AEDES AEGYPTI*

Research from Indonesia has demonstrated that local strains of the dengue mosquito, *Aedes aegypti*, has been found resistant to multiple insecticides. This includes fenthion, chlorpyrifos, malathion, temephos, and DDT. (SLD: many nations have identified this major vector as being resistant to multiple insecticide classes. A worrying trend considering that dengue cases are rapidly rising every year. Thus alternative technologies for disease control are increasingly becoming imperative.)

Source: *Journal of Medical Entomology* (20/Nov/2018), https://academic.oup.com/jme/advance-article-abstract/doi/10.1093/jme/tjy208/5193714?redirectedFrom=fulltext

TO BEE OR NOT TO BEE? NOT, WITH THE NEONICOTINOIDS APPARENTLY

A study released in the prestigious journal *Science*, demonstrated that bumblebees exposed to sub lethal disease of neonicotinoid insecticides were behaviourally affected. The bees were less likely to feed their young and spent more time on the edge of the nests. Often the whole colony can be affected and largely appear immobile. The colony fails to properly thermoregulate and does not properly construct the nest. (SLD: the neonicotinoids are widely used for the control of many insects, including garden pests. The pesticide has been blamed for the global decline in bee numbers and for inducing a syndrome called 'honey-bee colony collapse disorder', where the workers leave the nest. In 2018, the European Union Biocide Directory banned a number of neonicotinoids for outdoor use. The research in *Science* may expedite the decline in the use of these pesticides outdoor.)

Source: *Science* (9/Nov/2018), http://science.sciencemag.org/content/362/6415/683

INSECTICIDE RESISTANT IN MOSQUITOES TO *BACILLUS SPHAERICUS*

Bacillus sphaericus is a mosquito larvicide that is derived from a bacteria. This insecticide has very low mammalian toxicity and minimal environmental impacts, with few non-target organisms affected.

The insecticide has been widely employed since the early 1990's and resistance is increasingly being reported. For those agencies using this product on a routine basis, resistance monitoring is recommended.

Source: *Journal of Medical Entomology* (1/Nov/2018), https://doi.org/10.1093/jme/tjy193

CLEARING OF NATURAL FORESTS INCREASES MOSQUITO NUMBERS

Research in Hawaii found that the mosquito vectors, *Aedes albopictus* and *Culex quinquefasciatus*, increases when natural habitats are cleared to create agricultural and residential lands. The destruction of natural habitats is thereby increasing the risks of human diseases carried by mosquitoes.

Source: *Journal of Medical Entomology* (29/Oct/2018), https://doi.org/10.1093/jme/tjy117

STEAM TREATMENTS ON BED BUGS

Extreme temperatures, such as that from steam, has been used to control bed bugs for many decades. Steam is not only highly effective (if done correctly), the only chemical used is water and is thus has a low environmental impact. Recently the sublethal effects of steam was investigated by a team at Rutgers University in the US. It was found that for those bed bugs that survived, activity and feeding rates were decreased, however there were no effects on mating and fecundity.

Source: *Journal of Medical Entomology* (25/Oct/2018), https://doi.org/10.1093/jme/tjy113

REPELLING OLD MOSQUITOES

The most highly means promoted in reducing mosquito bites, and hence mosquito-borne diseases, is via the use of personal repellents, especially those that contain N,N-diethyl-3-methylbenzamide, more commonly known as DEET. DEET is an incredibly safe compound and highly effective at repelling a range of biting arthropods. Interestingly however, all research on the efficacy of DEET has largely been conducted on young mosquitoes. Yet it is old mosquitoes that transmit pathogens. The pathogen, be it viruses

or protozoans such as malaria, has to go through a developmental cycle within the insect, known as the extrinsic incubation period. A group of scientists from France tested how well DEET worked at repelling older mosquitoes and found it was far more effective at reducing biting than younger mosquitoes. This researcher further supports the efficacy of topical repellents at preventing mosquito-borne diseases.

Source: *Journal of Medical Entomology* (25/Oct/2018), https://doi.org/10.1093/jme/tjy134

SPATIAL INSECTICIDES FOR CONTROLLING *AEDES AEGYPTI*

Aedes aegypti is the most important vector of arthropod-borne viruses (arboviruses) in the world. The mosquito can transmit dengue, Zika, Yellow Fever, and Chikungunya viruses. Controlling this mosquito in the home is an effective means of reducing the burden of these mosquito-borne diseases. Scientist from Malaysia tested a range of mosquito coils containing the pyrethroids, metofluthrin, allethrin, trans allethrin, and prallethrin, against several strains of *Aedes aegypti*. Mortality ranged from 5-100% with the different insecticides, although metofluthrin always achieved at least 80% mortality. The results demonstrate that there is widespread pyrethroid resistance in the region and that coils containing metofluthrin are the most effective at controlling *Aedes aegypti*. Such research can aid in reducing the burden of mosquito-borne diseases.

Source: *Journal of Medical Entomology* (25/Oct/2018), https://doi.org/10.1093/jme/tjy130

INEFFECTIVENESS OF BENDIOCARB AGAINST BED BUGS

Insecticide resistance in both the common bed bug (*Cimex lectularius*) and the tropical bed bug (*Cimex hemipterus*) has been widely reported. Furthermore, resistance has been reported to just about every group of insecticides on the market. Researchers have recently demonstrated high levels of resistance to the carbamate, bendiocarb, in multiple bed bug populations across Paris. (SLD: arguably this is hardly surprising as resistance to bendiocarb was reported in Europe back in 2005. The demonstration of widespread and high levels of resistance, further emphasises the need for an IPM approach for the control of modern bed bug strains.)

Source: *Journal of Medical Entomology* (25/Oct/2018), https://doi.org/10.1093/jme/tjy126

NEW ZEALAND: INSECTS TO ELIMINATE WASTE

Researchers from New Zealand have tested the suitability of the black soldier fly, *Hermetia illucens* to breakdown organic wastes. These are common large black flies and the larval stage are often found in compost bins and worm farms. It was found that the soldier flies were highly effective at breaking down organic wastes high in fat and protein. (SLD: perhaps in the future instead of worm farms, we can have fly farms!)

Source: Environmental Entomology (16/Oct/2018), https://doi.org/10.1093/ee/nvy141

COCKROACH PROBLEM? LOOK AT RESIDENT ATTITUDES!

Researchers at Rutger's University in the US investigated the presence of German cockroaches (*Blattella germanica)* relative to various parameters including environmental conditions, resident demographics, and their tolerance to cockroaches. This was all undertaken in low income housing occupied by the elderly. Some 388 apartments were included in the study and 36% of the residents were unaware they even had cockroaches. Unsurprisingly, poorly maintained apartments with a low level of sanitation had significantly more cockroaches, around 2.7 times that of clean apartments. Thus residents' attitudes was a good indication of the level of cockroach infestations. With community education and assistance in housekeeping, cockroach levels should reduce in the housing complexes.

Source, *Journal of Economic Entomology* (13/Oct/2018), https://doi.org/10.1093/jee/toy307

INSECTICIDE RESISTANCE IS UNHEALTHY

When insecticides are in use against insects, the evolution of insecticide resistance is almost inevitable. The clear advantage is that the insect can survive the insecticide application, however resistance does come at a cost to the insect. A study examining insecticide resistance in the house fly, *Musca domestica*, found that resistant insects have a significant fitness cost. (SLD: in other insects, such fitness costs have been well described and may include reduced life spans and a reduction in fecundity such as less progeny.)

Source, *Journal of Economic Entomology* (1/Oct/2018), https://doi.org/10.1093/jee/toy300

WHAT INSECTICIDE CONTROLS COCKROACHES BEST?

Research from the US investigated the performance of several insecticides against field strains of the German cockroach (*Blattella germanica*). The chemicals evaluated included permethrin, chlorpyrifos, propoxur, imidacloprid, and fipronil. Propoxur was found to be the most toxic to the field strains, while permethrin was found to be the most repellent and least effective. (SLD: insecticide resistance is a very complex field of study. For example, the results from an investigation in a certain locality may not be relevant to other locations. This can be the result of variations in the types and degree of resistance occurring, and often reflects the different types of insecticides being employed to control the insect.)

Source, *Journal of Economic Entomology* (1/Oct/2018), https://doi.org/10.1093/jee/toy295

COILS TO KILL ADULT MOSQUITOES

Similar to the research mentioned above (Spatial Insecticides for Controlling *Aedes aegypti*), investigators from Indonesia evaluated the effectiveness of several pyrethroid-based commercial mosquito coils against field strains of *Aedes aegypti*. The insecticides tested included allethrin, metofluthrin, and transfluthrin. The results were dependent on the strain used as many were quite resistant to the pyrethroids, with less than 80% mortality. For the same strain, the efficacy of the different insecticides were fairly similar. The high level of resistance will mean that control programs recommending these types of coils will need to be reconsidered.

Source: *Journal of Economic Entomology* (27/Sep/2018), https://doi.org/10.1093/jee/toy296

STOPPING FLIES IN CHOOK POOP

The Stable fly, *Stomoxys calcitrans*, is a serious pest species. The bites are very painful and can cause injuries to stock and companion animals. The fly breeds prolifically in poultry manure such that the use of raw manure is banned in many areas. This is a great loss as the manure is a rich source of nitrogen for agricultural lands. To prevent Stable fly breeding, researchers from Western Australian added various compounds to the raw manure and found with the addition of sodium bisulfate, fly production ceased, while boosting the fertilizer value of the manure.

Source: *Journal of Economic Entomology* (26/Sep/2018), https://doi.org/10.1093/jee/toy277

WHO NEEDS MEN? NOT ALL TERMITES!

It was recently discovered that colonies of the Japanese termite, *Glyptotermes nakajimai*, can exist without males. Thus the whole insect makeup is entirely female. In fact even the Queens of the colony were found not to have stored sperm, and the eggs hatched even though not fertilized. This unisexual approach is thought to help the species adapt to a range of new environments and allows for more rapid colony growth. *Glyptotermes nakajimai* occurs in forest areas and not considered a pest species.

Source: *The University of Sydney* (25/Sep/2018), https://sydney.edu.au/news-opinion/news/2018/09/25/sisters-do-it-for-themselves.html

NEW FUNGUS DISCOVERED THAT KILLS ROACHES

A recently isolated highly virulent strain of the fungus *Metarhizium anisopliae* was tested for the control of German cockroaches (*Blattella germanica*) in the laboratory. The fungus was able to kill all first to third instars nymphs tested and produced almost 80% mortality in adults. (SLD: there are now several biocontrol agents on the market, originally isolated from dead insects. Perhaps this is one for the future.)

Source: *Journal of Economic Entomology* (25/Sep/2018), https://doi.org/10.1093/jee/toy280

MOSQUITO KILLING FLOWERS

The search for natural alternatives to kill mosquito larvae has led to scientist to investigate the efficacy of various plant extracts. Crude extracts of the Mexican Poppy, *Argemone mexicana*, not only inhibited larval growth but also had strong insecticidal activity against second instar larvae. Perhaps this could be another insecticide to the future.

Source: *Journal of Medical Entomology* (18/Sep/2018), https://doi.org/10.1093/jme/tjy159

INTERNATIONAL MONITORING OF THE CAT FLEA TO IMIDACLOPRID

Imidacloprid is an insecticide that is wide used for the control of cat fleas (*Ctenocephalides felis*) on companion animals. The concern is that with such widespread use, insecticide resistance will develop. An international team of scientists were established in 1999 with a view to monitor internationally, resistance to this compound. In the years of testing from 2000 to 2017, there is no evidence for decreased susceptibility to imidacloprid.

Source: *Journal of Medical Entomology* (29/Aug/2018), https://doi.org/10.1093/jme/tjy092

SOUTH KOREA: WASP STINGS AND NEST REMOVALS

Between 2010 and 2014 in South Korea, there were almost 500,000 requests to remove wasp nests and around 80,000 injuries from wasp stings, with 49 deaths. Of patients with stings, 1.5% required hospitalization. It was estimated that wasp stings cost the health system just over USD$3 million during this period. (SLD: there has been a notable a lack of research into the economic impacts of urban pests. The dramatic findings from this research highlights the need for further work in this area.)

Source: *Journal of Medical Entomology* (22/Aug/2018), https://doi.org/10.1093/jme/tjy144

MALAYSIA: DETECTION OF *BORRELIA* BACTERIA FROM LOCAL TICKS

Borrelia are bacteria species that are responsible for conditions such as Lyme disease and Relapsing Fever in the northern hemisphere. In a study using molecular techniques from the Selangor region of Malaysia, ticks were collected from rodents and tested for the presence of *Borrelia*. Of the ticks tested, 72 out of 156 were positive, and all ticks yielded *Borrelia* were *Ixodes granulatus*. Further genetic analysis demonstrated that the *Borrelia* were closely related to a recently described species, *Borrelia yangtzensis*, which has been reported from Japan, Taiwan, and China. (SLD: a number of studies over the last few decades have revealed the presence of *Borrelia* from mice. However, such bacteria may not be human pathogens and unrelated to conditions such as Lyme disease. Further work is required to establish a link between these bacteria and human disease.)

Source: *Journal of Medical Entomology* (17/Aug/2018), https://doi.org/10.1093/jme/tjy122

AUSTRALIA: NEWLY DISCOVERED TICK PATHOGENS?

Modern molecular based technologies are being used to detect potential pathogens from a range of biting arthropods. These molecular techniques are extraordinarily sensitive and are revealing a range of never before discovered bacteria, viruses, protozoans, and rickettsia. A group of researchers from Sydney, Australia, have revealed a range of new viruses from local tick species. This includes a virus closely related to the human pathogen, Colorado Tick Fever virus, which occurs in the US. While such discoveries are uncovering microorganisms never previously been discovered, they cannot tell us if the new organisms are human pathogens, but such investigations open up a whole new area of research. (SLD: I was part of this research. In recent years there has been a major controversy over the existence of Lyme disease in Australia. Lyme disease is a tick-borne disease carried by *Ixodes* ticks in the Northern Hemisphere. A number of patients have been described with the condition locally, but there appears to be no evidence for the existence of the bacteria that causes the disease.)

Source: *BioRxiv* (7/Aug/2018), https://doi.org/10.1101/386573 ■

Events Calendar

Upcoming Pest Management Events from Across the Globe

Is yours missing? Send details to Stephen Doggett or David Lilly!

PestEx (BPCA)
20-21 March 2019
Excel, London
www.pestex.org

Singapore Pest Management Association, Pest Forum
24-25 April 2019
Orchid Country Club
Singapore
contactus@spma.org.sg

Chinese Pest Control Association Annual Conference
April 2019
Nanchang, China

Educon 2019 (Rapid Solutions)
8-11 August 2019
RACV Royal Pines
Gold Coast, Qld, Australia
www.rapidsolutions.com.au/our-story/our-conference

PMANZ 2019 Biennial Conference and AGM
22-23 August 2019
Waipuna Hotel and Conference Centre
Auckland, New Zealand
www.pmanz.nz/2019-conference-and-agm.html

FAOPMA-Pest Summit 2019
24-27 September 2019
Daejon Convention Center
Daejon, Korea
www.faopma2019korea.org

PestWorld (NPMA)
15-18 October 2019
San Diego, California
www.pestworld2019.org

Name This Pest!

A Pest Will Be Featured Each Newsletter, Find Out What This is in the Next Edition

Stephen L. Doggett

Stephen L. Doggett

Hint: this is around 10mm in length, occurs in wet areas, causes a lot of worry (but has no medical significance), and is one of the most common species submitted to Medical Entomology laboratories.