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ANG TAN LOONG
PRESIDENT (since 2003)

It is with true humility and a tremendous joy sensed by me, for being appointed an Honorary Advisor to the Pest Summit 08 Bangkok by the Council of TPMA or Thailand Pest Management Association. This recognition is not only confined to me but I am sure is shared at home by many members of The Pest Control Association or PCAM (Pee cam) as we are affectionately known.

It only goes to show that our labor is not in vain after many years of hard work and struggles that we had encountered during my tenure of President since 2003. Prior to this in the year 2001, I was the Organizing Chairman for our local summit held in Penang, one of the most elaborated islands of Malaysia. It was with profound reminiscence, that from this convention, it did garnered the interest of SPMA or The Singapore Pest Management Association and together with PCAM, we endeavor to realize the birth of bilateral relations in the arena of Urban Pest Management for the benefit of our region. The year of 2003 was an illustrious, promising and exciting year for me as I was not only entrusted with the portfolio of Summit Chairman for the inaugural Pest Summit 03 held in yet another beautiful island of Langkawi, Malaysia, but was also elected unopposed to the ever hot seat of the post of President of PCAM. It was in this summit, a memorandum of understanding was initiated by the 2 associations to include some of our ASEAN neighbors as witnesses and ultimately as co-organizers for future pest summits.

The most unique and distinguishing strength or rather the collaboration of PCAM and SPMA was the strong bonding we were able to forge despite the unhealthy political differences between our 2 nations at that juncture. We managed to placate our fellow members that politics has no place in pest management! Tribute must go to the Past President of SPMA Major. G. Surajan for his vision and foresight of hosting world class pest conventions to the advantage and benefits for this region which today I am sure Major G. Surajan will definitely take pride in. Today this particular bonding has been extended to TPMA and IPCA (hopefully, Philippines soon) and we are greatly honored to have these 3 associations as our cherished associate members with many more regional countries to come hopefully in the very near future.

The second Pest Summit 06 held in Singapore or Lion City was another testament to the solid foundation, that we were able to emulate more advanced countries in organizing world class conventions, albeit possibly on a less grandeur scale as we attempt to live up to our calling: "ASEAN, the Place where Asia's Pest Managers Meet". Here shall truly be the place to address global challenges of pest management with remarkable recognition and it is important that not just the technologically advanced but also the developing regions of the world will be able to share in the advantages of participating in these summits.

Coupled with the magnanimous contributions from our chemical and equipment manufacturers and suppliers, we are committed to ensure there shall be another resounding success in this coming Pest Summit 08 Bangkok. From our experiences, we are much aware that organizing such a summit of this magnitude demands a great deal of thankless sacrifices on the summit committee but I am sure, banking on the previous successes, our member countries will solicit for delegates and rally to converge and participate in this Bangkok convention. Therefore it is never too late to register for this Summit and you may log on to www.pestsummit2008.com for further details.

In conclusion, it is our earnest desire that this Pest Summit 08 (from 13-15 August) will act as a catalyst and a platform to many more wonderful conventions to come and realize our vision to profile the 5 organizing countries to the rest of ASEAN and ultimately to the industrialized world, that we can make it together in this spirit of goodwill, irrespective of the inevitable minor differences in culture, tradition and language. It is my sincere desire to see this summit grow not only in terms of quantity but in quality and our Indonesian counterparts will have the opportunity to observe and be motivated by Pest Summit 08 come 2010, in the beautiful island of Bali where we will most likely be converging as indicated by IPCA as our beloved Host!

Thank you,
Ang Tan Loong
President PCAM



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Recent Advances and Innovations in [Mosquito] Control

(continue)

By **Dr Lee Han Lim**, (Ph.D)

- **Medical Entomologist, Institute for Medical Research, KL**

The development and use of IT (Information Technology) in various fields has also allowed the use of GIS (Geographical Information System) and GPS (**Global Positioning System**) in mosquito control and surveillance and prediction of disease outbreak. GPS is widely used for mapping of vectors and the disease they transmit. These technologies are highly effective and ultimately can be used to replace the traditional method of mapping.

Other innovations such as **mosquito larvae trapping device, electronic mosquito repellent device, use of herbal extract etc.** are new but scientific studies are required to test their effectiveness.

5. Discoveries of New Control Methods

Several new methods/ concepts/ technologies are currently under development. These still need more studies to ascertain their suitability and effectiveness.

For many years, scientists proposed the development of techniques to convert a vector mosquito to a non-vector by genetic manipulation. Recently, this goal is achieved by the creation of a strain of **Anopheles gambiae** (vector of malaria) that is

incapable of supporting the development of malaria parasite and strain of **Ae aegypti** not able to transmit dengue virus. However, it is now known that under lab conditions, these genetically modified mosquitoes would regain their vectorial capacity after several generations of in-mating.

Currently under our investigation is the concept of Chemo-control of vectors. This involved the administration of chemical agents used in the treatment of disease to the host. When mosquito vectors fed on the treated host, they will be affected by the presence of the chemical in the hosts blood. This concept was tested in dengue control in which **Ae aegypti** adults were allowed to feed on blood containing **ribavirin**, an antiviral drug. The treated mosquitoes were later not able to support the development of dengue virus and they were sterilized in that no eggs were laid. In addition, high mortality was observed in treated mosquitoes.

Another new technology under development is an **electronic device** designed to detect the presence of mosquito adults. This may assist in locating the presence of the mosquitoes before they bite and suck blood.

In conclusion, many advances and innovations are reported over the last 5 years. Many of these advances will or are already affecting the way we control mosquitoes. There is still the need to incorporate these new knowledge into mosquito control programs in order to maximize its outcome. Successful integration of these technologies will hopefully and eventually render mosquito-borne disease to become non-threat to public health in the future.

Malaysian contingent spearheaded by PCAM to the Pest Summit, Bangkok (13-15 Aug.08)

Once again, PCAM lead by our PCAM President, **Mr Ang Tan Loong** who is **Appointed VIP Advisor** by the Thailand Pest Management Association (TPMA) and the PCAM Working Committee of **Johnny Ooi, Chong Yee Seng, Wahid & Rajan**, are able to recruit 80 participants to the above summit. The last pest summit in Singapore 2006, PCAM recruited 113 participants which made up the largest Contingent from Malaysia to support the Singapore Summit. PCAM hopes that the 80 Malaysian Contingent could be the largest for this Summit in Bangkok. Most of the participants are our Active & Associate Members and they are as follows:-

Members	No:	Members	No:	Members	No:
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Abadi Hygiene	4	Bayer CropScience	4	Agricultural Chemical	3
ISS Facility	3	Sara Lee Malaysia	3	Ehsan Fumigation	3
Rapidkill Pest	3	Foggers Marketing	3	Excellent Pest	3
MSR Green	3	Entopest	3	URC Global Care	2
Phoenix Pest	2	UMC Service Master	2	SK.Perniagaan MS	2
Nasmal Pest	2	Woodpecker	2	Knockout Pest	2
Effort Fumigation	2	Sarawak Pest	2	D-Zach(1) &Aneka Pest(1)	2
New Tech Pest	1	Popular Pest	1	Wesco Agencies	1
Roachantra	1	Pest Pecker	1	Betaray Cekap	1
Seri Jaya Pest	1	Ancom Crop Care	1	Stopest (M) Sdn Bhd	1

EDITOR'S NOTE

ANDROO SUNG
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Good service counts!

Every business has its fair share of competitions. Even more so in Pest Control and Hygiene businesses!

You may specialize in Pest Control & Hygiene services as you have years and years of experience. But don't for a minute think that yours is a nice business and customers will come in droves as you offer the best value for money.

Take a quick look at the Pest Control postings in the website and you will see that we have more than 200 Pest Control services postings. So, how does a potential client differentiate your services from others? Price is crucial, of course, but it is not the only determining factor.

Today's customers, spoilt for choice, usually go "shopping" before they decide on a service provider. They look at price as well as customer service – the added services that you can provide to give them value for money. Good customer service would encompass the following:-

1. Meet your clients' deadlines: If you accept to take on an order or a project, be sure that you deliver on time. It will not do to come up with excuses that you needed more time. If you feel you cannot meet the client's deadline, be frank and tell it right from the beginning. It's much better not to take on a project and still maintain goodwill and rapport with your client. There is still hope that, in future, he would think of you first, should he/she have a project or order. Hence, one bad experience from you, chances are your client is not going to come back to you! In today's competitive working environment, the saying "It's difficult to get a customer but easy to lose one" is very true.

2. Stay in Contact: You may have clients who have not used your services for ages. Do not assume they will never call you again. There is a high probability that they may still be keeping your contact but there has not been an opportunity for them yet. If they liked your services the first time, they may also refer you to their friends or clients. Thus, it is important that you keep contact and they remember you. Send them greeting cards and birthday cards. On your dry days, give them a call and if possible, have social visits on them.

3. Keep your words: Pest Control business rely a lot on relationship and bonding. And with this comes trust and integrity. Be an honest business person. There are times when you need to make short-term sacrifices to get the long-term business commitment. A 30% discount or some free gifts etc, Stick to your word even if you find out that you have miscalculated it. Similarly, don't ever compromise on business etiquette- when you have confirmed an appointment. The same applies with delivery of customers' orders. Should you face difficulties to meet the delivery time, keep your clients informed and work out other delivery options. Tell the truth: "Honesty is the best policy".

4. Deals with complaints effectively: Customers complain for a number of reasons ranging from bad services to late delivery. The key lies in how effectively you deal with complaints ensuring that at the end of the day, the customer is satisfied with your proposed actions/settlement. Solve complaints quickly and customers will have more trust in you, leading to increased loyalty.

Make sure that you can create a complaints policy if it helps, outlining the main procedures of dealing with complaints and the customers' rights.

5. Prepare Certificates and documents: Get ready the necessary documents / certificates to support your company's credentials:- the proper licences like PAL, PCO, Storage, fumigation etc, training & exam / competency certificates, branding & recognition certificates eg. Superbrand, ISO, HACCP, IPPM, GMP, AFAS, MAFAS etc & Association membership certificates eg. PCAM, MCPHA, MOA, AQIS, MOH, Pesticide Board etc.

6. Read up & update: For best practices, pick up any customer service books from book stores. Surf the net and inform yourself on what other successful businesses do. It is not the size of the business but what they do best that matters!

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Recent Advances and Innovations in [Mosquito] Control

By Dr Lee Han Lim, (Ph.D)
- Medical Entomologist, Institute for Medical Research, KL

Introduction

Mosquitoes are still one of the most important insect groups in the world because of the diseases they carry and transmit, such as **malaria, dengue, filariasis, Japanese encephalitis** that has seriously burdened the globe with significant morbidity and mortality. Mosquito-borne tropical diseases have deprived people of all generations from a healthier and a better world.

Globally, malaria risks at varying degrees exist in 100 countries with over 40% of the world's population. The incidence of malaria in the world remains at 300-500 million clinical cases annually, with 1.5 to 2.7 million deaths. The vast majority of malaria deaths occur among young children in tropical Africa. Dengue is prevalent in over 100 countries and threaten the health of more than 2.5 billion people, living in tropical and subtropical regions. Dengue is the cause of an estimated 500,000 hospitalizations each year, with some 24,000 deaths each year. Filariasis, most commonly recognized by the elephantiasis and male genital damage it causes, is endemic in at least 73 countries where 120 million people are infected.

In Malaysia, malaria and dengue are viewed as the two most important public health diseases in 1997, there were some 27,000 reported malaria cases, with the highest incident in East Malaysia. As for dengue, since 1989 there has been an increase in the number of reported dengue cases, with 24,681 reported cases in 1998. The lesser important mosquito-borne diseases in Malaysia, filariasis has seen a gradual reduction in the number of reported cases over the years, while Japanese encephalitis is gaining much public attention with its recent outbreak in 1999.

Mosquito vectors belong to the 4 genera, namely **Anopheles, Aedes, Culex and Mansonia**. The anophelines are known to transmit malaria and filariasis to human, while *Ae aegypt* and *Ae albopictus* are vectors of dengue. *Aedes* is also responsible for the transmission of Chikungunya virus. *Culex quinquefasciatus* is both a nuisance and a vector for bancroftian filariasis and *Cx gelidus* and *Cx tritaeniorhynchus* are vector of Japanese encephalitis. *Mansonia* are vector of brugian filariasis.

The control of diseases transmitted by mosquitoes rely on the interruption of the transmission cycle by suppressing or controlling the vector populations. Current methods are (i) vector surveillance, (ii) chemical control, (iii) biological control, (iv) personal protection, (v) environmental management (source reduction) and (vi) legislation. These methods have to a degree successfully curb mosquito-vector diseases. However, the development of vector resistance to chemical control agents and parasite resistance to drugs have resulted in outbreaks and mosquito-borne diseases such as malaria and dengue are still the world's no.1 public health problems. Obviously, new, innovative, cost-effective and sustainable control methods must be developed.



Advances & innovations in mosquito control

These advances and innovations can be categorized as:

1. New Control Agents

Prominent among new control agents are microbial agents that are widely used today. The agents, ***Bacillus thuringiensis* serotype H-14(Bti)** and ***sphaericus* (Bs)** are spore-forming bacteria isolated from soil samples and dead mosquito larvae. Mosquito larva-killing crystal toxins are formed by the bacteria during sporulation. These crystals are activated specific proteases in the intestines of the mosquito larvae under the naturally alkaline environment. The activated toxins then destroy the intestines causing blood poisoning in the larvae and subsequent death. The toxins are activated in other non-target organisms such as human, fish, bird etc. and hence are harmless. The killing action of the toxins is rapid (5-10min) if the concentration of the bacteria is high. Since its first use about 25 years ago, no resistance to Bti is reported to date, although resistance to Bs has been reported in several countries. Both Bti and Bs products are commercialized and available as various formulations of wettable powder, water dispersible powder (wdp), aqueous suspension etc. Today the wdp formulation is preferred due to its stability, long shelf life and ease of mixing with water. The application dosage is usually 1 L of the reconstituted solution per hectare.

In Malaysia, local isolates of Bti and other *B.thuringiensis*. Bs and other bacteria were obtained. Some novel isolates e.g. ***B.thuringiensis jegathesan (Bti)*** and ***B.thuringiensis pahangi*** were reported for the first time. An isolate each of Bti and Bs was successfully mass-produced and commercialized.

Another new biological control agents are the **indigestible microalgae**. These are found in mosquito breeding habitats as food for the larvae. Some microalgae e.g. ***Scenedesmus*** are indigestible and the larvae cannot obtain the nutrients required to sustain life and hence starved to death. Microalgae, like bacteria are harmless to other non-target organisms.

Likewise, several new chemical agents have made their impact felt. **Modern pyrethroid formulations** are widely used because of their effectiveness and relative low mammalian toxicity. Pyrethroids and other chemicals such as **insect growth regulators** are increasingly used in mosquito control.

2. New Applications Techniques

It is obvious that new control agents such as the bacterial agents need to be dispersed effectively. The traditional method of knock sap spraying is not adequate due to its low coverage and short throw distance.

Mass application techniques for the dispersions of bacterial control agents have been developed. The first such method is **the use of cold fogging** using ultra-low-volume (ULV) generator.

Recent Advances and Innovations in [Mosquito] Control

(continue)

By Dr Lee Han Lim, (Ph.D)

- Medical Entomologist, Institute for Medical Research, KL

The machine is vehicle mounted and bacterial solution can be dispersed under pressure. Using this method, dengue vectors can be controlled in the urban areas. More recently, it was discovered that **thermal fogging** can also be used to disperse bacterial agents without loss of activity. It was thought previously that heat would deactivate the toxins which are heat-labile as the temperature in the heating chamber of the thermal foggers is about 200° C. However, a study conducted by us indicated that when Bti is diluted in water and fogged water seemed to protect Bti toxins from heat degradation, as the contact between Bti solution and heat is very brief. Moreover, the nozzle temperature which is about 70° C dropped to 40°C. Hence Bti is discharged at 40-70 °C which will not deactivate the toxins. The thermal application of Bti will enable widespread use of this control agent as thermal fogger is available to most vector control personnel.

Another new application technique is the finding that certain aquatic plants tend to absorb **organophosphorus (OP)** insecticides through foliar (leaf) surfaces and transport them downwards to roots. This discovery is important for the control of **Mansonia** larvae which attach themselves to roots of aquatic plants. The thick covering of aquatic plants on water surface effectively protects the larvae from direct application of chemical and/or biological **larvicides**. The translocation of OP from foliar surface of the host plant to the roots will kill all larvae attached to the roots.

Impregnation of materials such as bednet, clothes, plastic sheet with pyrethroids is today widely used in personal protection against malaria and other vectors. Extensive tests in Malaysia indicated that pyrethroid-impregnated bednet is effective in reducing malaria cases by about 12%.

3. Development of New Concept

For decades, the development of chemical and biological control agents has enable the implementation of effective larviciding and **adulticiding** against mosquitoes. Initially, larviciding was emphasized, for instance, in malaria control as it was recognized that larviciding effectively eliminated the source of **anopheline** breeding. However, with the advent of adulticiding techniques, for example, indoor residual spraying, larviciding is considered secondary in vector control. This compartmentisation of adulticiding & larviciding has created new challenges. For example, in dengue control operations, adulticiding against the **Aedes** is conducted by health authorities, while the lay people are expected to conduct larviciding by using **temephos** in potable water.

This is often ineffective since the proportion of household using temephos is often very low (0-15%). Hence dengue control is often hampered by adulticiding accompanied by ineffective larviciding. The most effective form of control is therefore a combination of **larviciding and adulticiding** conducted simultaneously. The development of microbial control agents of Bti and Bs has enabled the simultaneous use of both **biolarvicide** and chemicals were not antagonistic to each other and can be mixed and applied simultaneously without loss of activity.

This new concept was tested extensively in dengue vector control which showed the effectiveness of the method. Similar concept was used in control of malaria vector in Sabah with much success. Simultaneous ULV fogging of Bs combined with **pyrethroids** was also shown to be highly effective against the **Culex** vectors (of Japanese encephalitis).

Chemicals originally exhibiting adulticiding or larviciding activities were also mixed. **Malathion (an adulticide) and temephos** (larvicides) mixture was tested successfully against **Aedes** vector, while a combination of **alphacypermethrin** (pyrethroid **adulticide**) and **flufenoxuron** (insect growth regulator) was also successfully used against mosquitoes and flies.

In personal protection measures, the traditional method of applying chemical repellent (e.g. **DEET**) is now increasingly replaced by "herbal" extracts claimed to exhibit repellent activity against mosquitoes. Both lab and field testings had, however, shown that **herbal repellents** were partially effective against biting within a limited time duration. A recent innovation involved the mixing of herbal repellent with very low concentrations of DEET. The mixture was found to exhibit more than 8 hours of complete protection against mosquito biting in lab testings.

4. Research & Development in New Technologies

The developments of new and innovative technologies in vector control are important in order to ensure cost-effectiveness, sustainability and safety. One such new development is the rapid detection techniques of insecticide resistance. The detection of insecticide resistance is vital in terms of control effectiveness and contamination as chemical insecticides are still the forerunners. For many years, the detection of insecticide resistance was dependent on the use of WHO standardized test procedures in which insect are exposed to insecticides and their responses calculated to obtain the degree of susceptibility. This method, though useful, is nevertheless slow, need large number of insect etc rendering it difficult for use especially under field conditions. The successful development of rapid biochemical tests can overcome these problems. These tests were designed to determine the level of resistance enzymes in insect as enzymes such as **esterases, oxidases** and others are responsible for the metabolic degradation of chemical insecticides. These biochemical tests are rapid (10-30min), requiring single insect specimen, cost-effective, colourimetric and can be used under field conditions. These tests are now commercialized as kits which are available.

Another development of new vector control technology is the insecticide-impregnated paint. This is the normal emulsion paint formulation which is impregnated with a **pyrethroid (deltamethrin)**. The technology enables the slow release of the insecticide hence is able to extend the residual activity to more than 2 years. This new paint formulation is effective against many house pests besides mosquitoes. It has great potential for use in areas in which normal spraying is not advisable e. g. kitchen, hospital, bakery etc. A further improvement of this paint formulation is the inclusion of a synergist to prevent the development of insecticide resistance.

The surveillance and detection of **pathogens** in mosquitoes is vital from the viewpoint of control, outbreak forecasting and transmission dynamics. Early detection of these pathogens e.g. **dengue virus, malaria parasites, filarial worms** etc. is often difficult with conventional methods such as dissection and cell culture. Recent development of molecular techniques such as PCR (polymerase chain reaction), molecular probe etc. had been successfully used in vector control although such use is still not widespread.