PCAM PEST INFO

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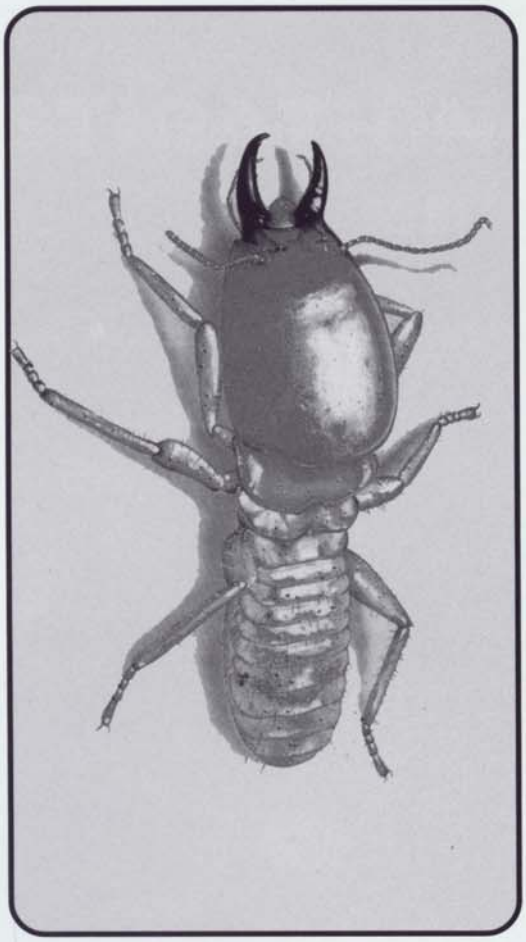
(For members only)

A Newsletter of the Pest Control Association of Malaysia



FOCUS ON TERMITES

CONTENTS

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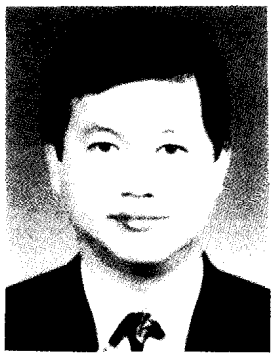


President's Message

We are moving toward the year 2000 with great challenges and anticipation. We should be, mindful that 1999 has been a great year as we have seen tremendous changes in the political areas, economic, technological and business environment. We are thankful to God that we have recovered from the turbulence of the economic recession of mid 1997 to 1999.

We have recently shifted to our new premises at Pandan Perdana from Pandan Indah. The area is much bigger so as to create a bigger space for future training facilities especially the coming Pesticide (PCO) Rules 1999. We are also in the midst of putting together the training materials and resource person in preparing our PCO in the exams and would like to start it as soon as possible.

We are happy to note that on 25th November 1999, PCAM recommended the Warranty Period of two (2) years and one (1) year for the Pre & Post Construction Anti-Termite treatment respectively have been accepted positively by the consumers. PCAM is confident that with all the PCO's cooperation, we are able to achieve 100% success. We really believe that recommendation will not only benefit to the consumers but also to the PCOs as well.

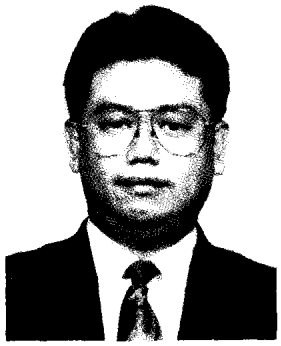
Once again, we want to thank you for your contribution in making the Association a success.
We appreciate all the

* Active/Associate members
* Allied members
* Affiliate members
* Honorary members
* Executive members
* And not forgetting our only admin staff
  – Mr Anson Raymond

We would like to specially invite you to our new office at our coming AGM.
We look forward to seeing each of you.

Thank you.

Stephen Liu
PCAM President



Editor's Note

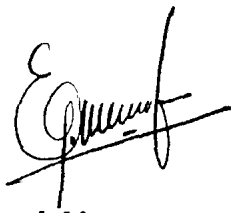
The response to the 2 training seminar organised by PCAM recently is most encouraging. The "Introduction to Cockroach Seminar" conducted in Bahasa Malaysia has 44 participants while the "4th PCAM Fumigation Course" has 22 participants.

To all organisations who have sent in their staff for these training, I would like to congratulate you for your wise action and far-sightedness. In allocating budget for your employees' training, you have groomed them to be knowledgeable and professional in their work. Thus, the pest control industry standard and professionalism would be upgraded and this is in line with the objectives of the Pesticide Board of Malaysia as mentioned in their proposed Pesticides Act (Pest Control Operator) Rules 1998.

At the same time, I would like to suggest that the 2-way communication between PCAM members and the EXCO should be more enhanced. I strongly urged members to come forward with suggestions, proposals and comments on how to make the PCAM's effort and contribution more meaningful and beneficial to all its members and the industry. The EXCO team, volunteers who are elected to their respective offices by members appreciate and look forward to any contribution from all of you. ***The PCAM is after all, an association of member of the pest control industry, elected by its members, for its members. So, help the association to help yourself.***

On this note, I would like to thank all who contributed to the association and look forward to more from all of you.

Best regards,



Fred Lim
Vice President - Communications

MANAGING RISKS IN THE PEST CONTROL INDUSTRY - THE PCAM'S ROLE

by

Michael PF Moi, PCAM

Introduction

The Pest Control Industry in Malaysia is increasingly a major user of Public Health pesticide formulations, complementing the work of government agencies in domestic homes, commercial and manufacturing premises.

Heightened public awareness, a buoyant economy before mid 1997 and a more thorough commercialization of services controlling pests, have jointly been responsible for the surge in demand for public health pesticides in recent years. Where Pest Control Operators (PCOs) were needed, consumers were quickly made aware of the depth of expertise inherent in pest management work. For the PCOs, these occasions served to remind them of their vital supporting role in the commercial life of the country.

Today as never before, the services provided by PCOs are assessed by Consumers not only with price as the sole criteria, but with another eye on safety and the management of risk. It would pay every PCO to heed this trend.

The Consumer too plays a role in the equation of risk management. Whether it realises or not, it has the power to initiate changes in the existing patterns of pesticides usage. By forgoing an antiquated view of the use of pesticides as a *magic wand*, and putting more effort in sanitation, they make the work of PCOs less reliant solely on chemical means. This invites an approach which is more friendly to the Human Species and the Environment.

The Pest Control Association of Malaysia, PCAM, was founded in 1994 to represent a fledgling industry whose services are now used more widely by Malaysians than ever. Embedded in its *Code of Ethics*, is the notion that risks should be managed. I quote from paragraph 6 of its Code: "*...to render pest control services safely and in keeping with good practices ...*"

It is the PCAM's view that as the industry's role increases, the industry, being a significant user of Public Health Pesticides, must take on a more meticulous approach towards risk management.

Under scrutiny at close quarters

While the volume of pesticides used by the PCOs has traditionally been smaller than that for the agricultural sector, PCOs face a unique and challenging situation different from farmers. By nature of their work, applying pesticides close to where the general public live and work, their activities inevitably attract harsh scrutiny from a discerning public now more aware and well - informed. The PCAM on several occasions, has served as a point of contact with the general public, resolving successfully, instances of client dissatisfaction relating to safety.

Among the PCOs' clients, multinationals have more knowledge about pest management and pesticides than others. Individual companies have produced specifications stating which pesticides they approve for use in their premises.

For companies which regularly use fumigants like methyl bromide, phosphine or hydrogen cyanide, their rapid toxic effects have meant that clients are more aware of the dangers associated with this method of treatment. In turn, they expect more stringent procedural controls from the fumigator. Clients also expect protection against damage for their raw materials, finished goods and equipment. Many major users of fumigation, for example the tobacco companies now routinely employ former PCOs to generally oversee the quality of pest management work including fumigation.

The Government and other market forces, some originating from abroad, have also been partly responsible for the need to alter perceptions of risk management by PCOs.

Factors encouraging a change in attitudes towards risk management

With the introduction of the Sales & Storage Regulations in 1998, pesticides had to be stored securely, and accounted for by simple stock records. The resumption of Fumigation Licensing, in the early 1990s, under the Hydrogen Cyanide Act 1953 created fresh activity in regulating and monitoring fumigations all over the country. The syllabus for the licence was biased, and correctly so, towards safety.

With the introduction of the OSHA in 1994, PCOs were required to provide safety equipment and medical surveillance for their staff and to set up safety committees if their operations exceeded a certain size.

There is also impending new legislation in the pipeline regulating the issuance of licences to practising PCOs. In 1998, the Pesticides Board invited PCAM to actively participate in a dialogue, drawing out feedback from the industry, to design a workable piece of legislation. PCAM has since proposed a study syllabus towards obtaining the licence. A successful licensing scheme would certainly go a long way towards managing risks within the industry.

With the trend towards certifying for ISO 9000, clients in the manufacturing sector began to ask for Material Safety Data Sheets *(MSDS)*. Some even asked for *Borang B*, a one-page document certifying that the product was currently registered with the Pesticides Board.

In some instances, ISO 9000 clients asked for evidence of training for the technicians sent to work in their premises.

Some incentives for change were the inevitable result of exposure to an international export market. The same demands appeared to be made by companies not pursuing accreditation for ISO, but in response to the requirements of overseas principals in the more advanced countries.

What can the forward-looking PCO do ? For a start, he must set up a body of systems within his own company to train his staff, and to routinely assess for risk and to manage it. Only then can there be a prospect of remoulding attitudes and altering the way work is carried out in the future.

Current practices

Managing risks for the PCO takes three forms. One is directed at protecting the applicator, another at protecting the client, and the last at protecting the environment.

PCO work is carried out in many different environments, each of which poses different risks. The applicator must be able to choose from a variety of safety equipment suitable to the work at hand. In 1997 and 1998, the PCAM, organized several workshops on safety for its members and others in the industry.

To protect the applicator carrying out general pest control work, Personal Protective Equipment (PPE) e.g. gloves, respirator, faceshield or goggles, overalls and safety shoes constitute a basic arrangement sufficient for most needs. If the applicator is thermal fogging or drilling, he will require an ear muffler. If he enters a building site, he will be required to wear a safety helmet.

PCOs involved in fumigation work have higher safety requirements. There are overlapping controls from the Government and in-house company guidelines to keep fumigation safe.

Under the HCN Act 1953, fumigators must give notice to the Ministry of Health, the local authorities and the clients and their neighbours (Borang D & E) when they intend to commence gassing. As part of industry best practices, prior to starting work, fumigators are required to carry out a *Risk Assessment*, which is a systematic appraisal of potential risks to both fumigator and client.

Respiratory protection is also of a higher order than that for general pest control. For personal protection, a full-face mask equipped with appropriate canisters, is required in situations of low fumigant concentrations. More and more, a *Self-Contained Breathing Apparatus* (SCBA) is being used in situations of higher gas concentrations

To measure gas levels as a prelude to gas clearance as required under the HCN Act, fumigators employ appropriate measuring equipment. A clearance form, Borang F under the HCN Act, must be issued to the client when gas is cleared and the premises are safe to enter.

Under OSHA, fumigators are required by law to monitor their health which in the case of methyl bromide, is the bromide level in blood for those who fumigate regularly.

For PCOs working at heights as when engaging in bird control, they need to learn to use ladders, scaffolding or Mobile Elevated Work Platforms (MEWP), and also to wear appropriate fall-arrest equipment. From the experience of a major company in the United Kingdom, it appears that more technicians suffer injuries from falling off ladders than from pesticides poisoning.

As protection for the Consumer, PCOs now routinely provide planned treatment schedules so that the clients and their employees are informed well in advance. PCOs are also advising clients how to prepare for treatments.

Some PCOs are also providing talks to raise the awareness levels of clients and their employees. Clients are taught to view pest management as including proofing and sanitation. Client education is now recognized as an integral step towards achieving this goal.

Newer formulations in the public health market, for example bait gels for cockroaches, cockroach baits in tamper-resistant boxes and baiting systems for termites all provide for more secure placement of pesticides and lesser health risk exposure to the Consumer. The diversity of PCO work constantly calls for more sophisticated formulations, and suppliers and manufacturers have responded well by introducing new products and educating the PCOs on their merits.

Many PCOs now get routine requests from their clients for Material Safety Data Sheets *(MSDS)*. This is prompted by a greater awareness of their function and general availability. In this regard the PCAM is encouraging the widespread use of *MSDS* by compiling them in a booklet form which can be issued to all its members, and can be carried down to the vehicle level .

Under the Sales and Storage Regulations, PCOs are required to separate fumigants and store them under lock and key. A separate requirement under the EQA requires bunds to be constructed around sites where there is bulk storage of chemicals. Store licences are renewed annually after an inspection of the premises by the Pesticides Board.

Clean air is also becoming a serious and visible issue especially after the country experienced haze last year. Some companies have begun to thermal fog with water rather than diesel, thus avoiding polluting the air with smoke particles.

Future practices

The future promises to be exciting for the PCO.

Even as we speak, new legislation is under way, which will specify the design of vehicles carrying dangerous goods on public roads. Vehicles will carry appropriate international signage indicating the nature of the goods.

For those who fumigate, the requirements of the *Montreal Protocol* will mean limited methyl bromide available to purchase on the open market, with whatever being available priced higher. Fumigators will therefore be required to work more precisely, using newer technologies to concentrate the action of methyl bromide and to reduce its loss through leaks.

When transporting fumigants, as in Western Europe today, we may also be required to carry Transport Emergency Cards *(TREMcards)* for individual fumigants if these are conveyed in service vehicles on public roads.

For PCOs engaged in Termite Control, teams may be required to carry appropriate spillage control equipment aside from what they normally carry now. This again will enhance the confidence of the consumer.

PCOs will begin to offer services like proofing and monitoring which do not require the use of pesticides. Only when pests are proven to be present will the PCO begin to use chemical methods of control.

Suppliers and manufacturers of pesticides will begin to offer complete packages in their sales effort, by making known well before hand, their in-house provisions for the proper disposal of used containers collected back from the PCO. These are on top of the disposal instructions now given on labels.

Conclusion

In a complex world with closely-knit global communities, the PCO is helping to control public health pests in the home country, and also the movement of agricultural pests across national boundaries. Carrying out these duties and managing the attendant risks will be a worthy challenge for the future.

Basic Termite Biology for Pest Control Operation

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Termites, or more commonly known as 'white ants' are a serious insect pests in the urban environment in Malaysia. More than RM25 million were spent each year for subterranean termite control in Malaysia, accounting for about 50% of pest control businesses in the country. Termite control services provided by Malaysian pest control operators include soil treatment (pre-construction) and post-construction treatment (barrier-, spot-and physical treatments). Despite the importance of subterranean termites, many local pest control operators know very little concerning the biological aspects of subterranean termites, or termites in general. This paper is written to briefly introduce to the readers the interesting world of the biology of subterranean termites.

Termites, just like ants and bees, are social insects. This means that they live in colonies and showed caste differentiation. However, compared to the latter two, termites are a more primitive insect group. They undergo incomplete metamorphosis (egg -> nymph -> adult), unlike ants and bees that show complete metamorphosis development (egg -> larva -> pupa -> adult). At the adult stage, some termites (reproductive stage) have two pairs of wings. Their wings are usually similar in size and shape. Ants and bees, however, have longer frontal than the hind wings.

There are three major groups of termites of economic importance: (1) subterranean, (2) dampwood, and (3) drywood termites. The *subterranean termites* build their nests in the soil. They rely principally on soil for moisture. In the process of searching for food, they construct mud tubes, because they are susceptible to dessication when exposed to air. *Dampwood termites* live in old tree stumps, rotting logs and pieces of buried timber. Once the colony becomes established, they can move into sound wood in the structure of the building. On the other hand, the drywood termites live entirely within dry wood. They are less dependent on external source of moisture. For certain species, high moisture will kill them. Drywood termites do not need to access to the soil at all.

Insect-related wood damage can be caused by termites, as well as, other wood borers. It is extremely important to correctly identify the culprit, so that the right control method can be undertaken. Subterranean termites, especially the *Coptotermes* spp. often consume large amount of wood in the interior portion, until only a thin, but sound veneer is left on the surface. The interior surface is usually uneven in appearance and often partially covered with mud. Compared to subterranean termites, wood damage by dampwood termites often shows fungal decay with a velvet-like appearance in the interior part. On the other hand, damage by dry wood termites is often similar to that caused by carpenter ants, i.e. with smooth and clean interior surfaces, but with the presence of faecal pellet in the passages. Lastly, wood damage by wood-boring beetles have bored round, or oval holes, that often packed with faecal pellets and wood remnants in the tunnels.

An established termite colony consists of nymphs, workers, soldiers, primary reproductives, supplementary reproductives, king and queen. Workers are the most common individuals in a termite colony. They perform all kinds of work such as feeding other castes, grooming the queen, making tunnels, excavating the nest, etc. Termite workers are wingless, blind and not sexually mature. In the process of making tunnels and ingesting food, they chew and eat wood, thus causing structural damage.

Soldiers are involved in nest defence. They usually have large jaws and head. Soldiers usually gather at the opening of the nest to protect the colony from invaders. Some species have two sizes of soldiers, i.e. major and minor. The soldiers cannot feed on their own due to their big mandible, the workers will feed the soldiers. Supplementary reproductives consist of males and females. They are usually wingless, or have short non-functional wings, The female can, be developed, whenever it is necessary, to replace a primary queen who is injured or died.

Primary reproductives are the most common caste seen by house-owners. They are winged adults called alates. These individuals usually swarm when the temperature, humidity, light condition and barometric pressure are right (however, this phenomenon is not fully understood). After a short flight, the wings are broken off; males and females pair and attempt to establish a new colony. Each pair will make a small cell in which they will mate and lay eggs. After mating, the queen and king will not feed, but rely on their fat storage, and protein from wing muscles. Some may also eat some of their newborns. The number of eggs produced per day depends on the termite species. For example, *Coptotermes* can produce up to 100 eggs a day, but *Macrotermes* can produce 30000 - 40000 eggs a day. The king and queen will feed their first batch of brood from their own body food storage. The king will stay with the queen throughout its life. That is why termites are also considered the most monogamous group of animals on earth. When a queen dies or grows old, she will be replaced by supplementary reproductives.

Termites feed extensively on wood and wood products that contain cellulose. As termites do not have cellulase for cellulose digestion, they obtain the help of protozoans in their intestines to digest the cellulose. The ability of termites to consume wood is tremendous - A *Coptotermes* colony with 350000 workers can consume 30g wood a day, which equals a 2 x 4 inch one-foot board in 19 days!

Communication is extremely important to maintain efficient social integration and division of labour in the colony. Each termite colony develops its own characteristic odour. Intruders will be recognized instantly and an alarm pheromone will be released. This will prompt the soldiers to attack and kill the intruders. Besides chemical communication, termites also communicate with sound. Soldiers and workers bang their heads rapidly on surface of mud tubes or wood galleries when disturbed. The vibration produced will be detected by others in the colony and colony defence will be mobilized.

One of the most important characteristics in social insects is trophallaxis. Trophallaxis is a process of mutual exchange of food or nutrients between colony members. The donor will regurgitate the food eaten and pass them to the recipient. Food exchanges can happen from both mouth to mouth, as well as anus to mouth. With trophallaxis, nutrients can be distributed equally within a colony. It also enhances member recognition and plays an important role in the distribution of caste-regulation chemicals. The proportion of each caste in the colony is regulated chemically. Soldiers and reproductives produce caste-regulation chemicals and distribute these chemicals to other colony members through trophallaxis. This will inhibit the production of additional soldiers and reproductives.

Some species also respond to the high level of soldier-produced chemicals by killing some of the surplus soldiers. Lastly, trophallaxis enable cellulose-digesting protozoans to be transferred between members of the colony. When nymphs molt, they will lose their hind gut content, which also includes protozoans. To get a new supply of protozoans, they must feed from the anus of other colony members. Feeding of queens and soldiers by workers is also a form of trophallaxis.

It is hoped that with this paper, the local pest control operators will have a better appreciation of termite biology. With a good understanding in termite biology, the pest control operators will be more able to respond and accept the novel revolutionalized technology in the world of termite control. In the next issue, the author will write about termite baiting and its challenges.

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