

IMPORTANT DIFFERENCES IN TERMITE CONTROL IN SOUTH-EAST ASIA AND THE USE OF NON-REPELLENT TERMITICIDES UNDER SUCH CONDITIONS

JASON NASH

Development & Marketing Manager (India, South-East & North Asia), Bayer Environmental Science

Abstract Termite control practices in South-East Asia differ in some important respects to those typically undertaken in USA, Japan and Australia. Whilst the basic principles are similar, differences in construction practices, type of building, termite species, and environmental conditions each contribute to the necessity to modify the termite control solution. Higher density housing is also common in South-East Asia with large numbers of multi-storey apartment complexes, and terrace-type (linked) houses requiring protection. In such situations it is common for termites to gain access from an adjoining structure rather than from the soil. Another important feature of buildings is that they have a concrete-apron and drain surrounding the external perimeter of the building. The most common and damaging termite species are *Coptotermes* sp. In addition, buildings can be infested with *Nasutitermes* sp., *Macrotermes* sp., and *Microcerotermes* sp., amongst others. The environmental conditions are favourable to termite activity all year round. This means it is typical for termites to infest buildings within three years of being built. Termite control in South-East Asia represents a great challenge. It is critical that a thorough termite inspection is conducted prior to treatment to identify all the termite sources and entry points. With the introduction of non-repellent termiticides, a more reliable termiticide solution can be applied to eradicate and protect the structure incorporating both soil and above-ground treatments. Whilst 100% success cannot always be guaranteed, risks can be substantially reduced to very low and acceptable levels.

Key Words Building construction, environment, nest density

INTRODUCTION

Termite control practices in South-East Asia differ in some important respects to those typically undertaken in USA, Japan and Australia. Whilst the basic principles are similar, differences in construction practices, type of building, termite species, and environmental conditions each contribute to the necessity to modify the termite control solution. Just as in other countries around the world where termites cause economic damage, each situation must be assessed through a thorough inspection process before it is possible to tailor a specific control program, which will normally vary from site to site. Most methods of termite control available in the USA, Japan or Australia are also found in South-East Asia, but there are some important differences in how they are used, how effective each is, and their overall levels of adoption, because the situations in which they are used are often quite different. It is these differences that will be highlighted, and how the non-repellent termiticides, in particular, will become increasingly important tools for termite control in South-East Asia.

TERMITE CONTROL PRACTICES IN SOUTH-EAST ASIA

This region of the world differs in some important respects to those typically undertaken in USA, Japan and Australia. Whilst the basic principles are similar, differences in construction practices, type of building, termite species, and environmental conditions each contribute to the necessity to modify the termite control solution

Building Construction. Most buildings in urban areas in South-East Asia are typically constructed using concrete and brick on a concrete slab foundation. Termites typically infest structural wood in the ceiling or roof, but also cause serious damages to internal wooden fittings such as architraves, skirting boards, parquet flooring, door and window frames, staircases, and wooden cupboards and shelving. In contrast to other countries, buildings in urban parts of South-East Asia tend to use much less structural timber in the walls and floors, so there is less likelihood that major structural damage will occur as a result of termite attack. This means that in most cases, damage can be repaired without major structural works such as having to rebuild affected parts of the structure.

As the integrity of the structure itself is less likely to be threatened by termite attack, legislation for termite treatments or for termite inspections (such as upon ownership transfer) is seen as less important. Thus in most South-East Asian countries, it is not a requirement and therefore, it is extremely rare that a termite inspection is carried out when a property is sold. For some countries, there are limited regulations regarding the application of a preventative termite treatment during the construction phase, and if there are then these are not well enforced. Another important consequence of the fact that termites are unlikely to threaten the structural integrity of the building, is that the general public do not perceive the threat from termites as being very high. This is despite industry experience showing that there is indeed a very high risk that termites will attack a building within a just few years of it being built..

Unlike termite-prone areas of USA and Australia, very few people in South East Asia consider termite attack as a high risk factor; that is until they strike, and then they understand how expensive and inconvenient termites can be. Whilst perhaps no major structural damage occurs, repairs to skirting boards, parquet flooring, door and window frames, cupboards, etc., can still be very expensive, not to mention inconvenient. With the general public not recognizing termites as a significant risk factor to their homes, very few preventative treatments are conducted outside of the pre-construction phase. Most termite treatments in South-East Asia are conducted to eradicate active infestations, and it is only then that they realize the benefit of ensuring some longer-term termite protection.

As buildings in South-East Asia generally are constructed with concrete walls rather than with timber framing, there tends to be far fewer hidden voids (such as wall voids) for termites to travel or nest in. Instead the termites tend to move through structures via cracks in walls, electrical conduit or piping, or via wooden architraves, doorframes etc, or by moving across the ceiling or roof frames. Quite often, the termites will also build shelter or mud tubes on the outside of the concrete wall itself, which makes their identification and treatment much easier. Void treatments are therefore less commonly used South-East Asia, instead direct treatments to active mud-tubes or infested wood, are much more common. Typically, liquid or dust formulations are applied directly to the active infestations, although above-ground bait stations are also becoming more popular. This is in contrast to the use of termiticidal foams, which is more appropriate for situations where large gaps or voids exist and to where access is difficult.

Higher density housing is also popular in South-East Asia with large numbers of multi-storeyed apartment complexes, and terrace-type (linked) houses. Here, where more than one residence is found in a structure, it is relatively easy for termites to move from one person's unit or property to another person's through shared roof voids, structural roof timbers, conduit, piping, and cracks in common walls, ceilings, or floors. Termites don't recognize any ownership boundaries, and it is not uncommon for termites to gain access to a person's property above-ground via an adjoining structure or unit. This has significant implications for termite inspections, because termite entry points may not necessarily be from the ground, and the inspection must also determine any potential above-ground entry points.

It is important that any above ground source of termites is identified, because soil treatments alone may not be entirely effective in eradicating and protecting the structure if there is an above ground source and it is not identified and eradicated. Another important feature of many buildings in South-East Asia is that they have a concrete-apron and drain surrounding the external perimeter of the building. Unlike many homes in the USA or Australia, this concrete apron and drain prevents the pest control professional from having direct access to the soil adjacent to the foundation to conduct treatment. To treat the soil adjacent to the foundation, this concrete apron must be drilled around the entire perimeter. Studies have shown that such treatments do not provide a uniform distribution of termiticide in the soil, and consequently many gaps existing in the treatment, no matter how much care is taken with the treatment itself. Given these conditions and limitations it is virtually impossible to create a uniform barrier or treatment zone around a building.

The fact that almost all termiticides are applied by drilling and rodding into the soil is a major point of difference between most termiticide applications in South-East Asia and those in USA or Australia where most termiticides are applied by digging a trench in the soil. This is where the use of the non-repellent termiticides has significant benefits over the repellent chemistries in South-East Asia. The non-repellent termiticides such as Premise and Agenda are more tolerant of the treatment gaps when rodding because they can kill members of the colony that have not come into direct contact with the termiticide via their transfer or "Domino Effect". This tolerance for small gaps is probably the primary reason why soil treatments with these products generally provide more reliable termite control.

Termite species. Consideration of the major termite species found in South-East Asia is also important. In most countries, the most common economically damaging species are *Coptotermes* sp. In addition, buildings can be infested with *Nasutitermes* sp., *Macrotermes* sp., and *Microcerotermes* amongst others. Whilst most of these species nest in the ground or in trees and tree stumps, some species of *Coptotermes* sp. show an ability to survive above ground without having a connection to the soil.

With the fairly constant warm temperatures and high humidities experienced in South-East Asia, coupled with heavy periods of rainfall, conditions are conducive to termite survival above-ground. It is common to find sub-nests (and sometimes entire nests) above-ground in structures, particularly in roof voids, and they can survive quite easily without a direct link to the soil. A thorough termite inspection is a must to identify the presence of such nests. When they are found they must be eliminated using an appropriate above ground treatment. Unfortunately on many occasions such above-ground sub-nests do exist but are not found. When this happens, a typical soil treatment will not always work effectively, particularly if the above-ground colony has no link to the soil.

If a repellent termiticide is used to treat the soil around a structure where a direct connection does exist between termites in the structure and the soil, there is a high likelihood that this connection will be broken (termites will be repelled away from the area of treated soil above and below it). In such situations, the above-ground termites in the structure can, in an effort to survive, establish a sub-nest in the structure itself. When a non-repellent termiticide is used, termites won't detect the treatment, and as such they continue to pass through the treated soil, transfer the lethal effects to other members of the colony and many termites will die thereby reducing the potential (or capacity) for the remaining termites to form an above-ground sub-nest.

Coptotermes sp. also appear to be more aggressive than some other termites found in USA or Japan such as *Reticulitermes* sp. This means more damage can be done more quickly and that infestation can also occur more rapidly.

Given the favourable environmental conditions in South-East Asia, most termite species can exist with a large number of nests in a small area. Densities of more than 50 nests per hectare can be found in plantation or grassed areas. When such areas are developed for housing, these termites provide multiple sources for infestation. Thus, eliminating a nest on its own does not normally provide sufficient protection as termites from another colony can rapidly take their place. Thus ideally it is necessary to eliminate all the nests in the area, or alternatively provide some measure of long-lasting protection against future infestation from other colonies. Again the non-repellent termiticides are an ideal solution because of their effects on the termite colony plus the ongoing protection of the structure that they provide.

SUMMARY

Termite control in South-East Asia represents a great challenge, like other parts of the world. However, differences in building construction and termite species in South-East Asia requires an adaptation from the methods typically employed in USA and Australia in particular. The major differences are that due to the use of less structural timber and more concrete, the likelihood of major structural damage to the building is greatly reduced compared to USA, Japan or Australia. One consequence of this is that the general population does not perceive that termites represent a significant threat, despite the fact that there is a very high chance of termite infestation. As a consequence, very few preventive treatments are conducted despite the very real threat that termites pose.

The predominance of concrete walls in South-East Asia compared to wooden framed walls, means that there are few wall voids that may need treatment. Instead above-ground direct treatment focuses on direct treatment of shelter or mud tubes constructed in cracks, or on the outside of walls, inside or around electrical conduit or piping, or infested wood itself. Use of foams above ground is still somewhat limited. The predominance of apartments and linked houses in South-East Asia means there is potential for termites to enter a property via an adjoining property that may not be under the same ownership. The need to identify above-ground sources of infestation adds to the importance of a thorough termite inspection and treatment of adjoining properties if infestations are found. Virtually all soil termite treatments in South-East Asia are conducted by drilling and rodding due to the presence of concrete aprons around the external perimeter foundation. This means more gaps in the treatment and hence better reliability of control when using the non-repellent termiticides.

Some of the termite species found in South East Asia, in particular *Coptotermes* sp. have shown a strong tendency towards formation of above-ground colonies in the structure often without a direct connection to the soil. These must be identified by a thorough inspection, eliminated and the soil treated. The large number of termite nests that can potentially exist in a small area in South East Asia is quite large and long-term protection requires either the elimination of all nests or the use of non-repellent termiticides which can affect colonies as well as form a zone of protection around the structure.

Key factors for successful termite control under South East Asian conditions include: a thorough termite inspection; the careful application of direct treatments for above-ground infestations, and the use of non-repellent termiticides for soil treatment.