

THE ECONOMICS OF TERMITE BAITING IN A SOUTH EAST ASIAN SCENARIO

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Abstract Termite baiting has evolved in recent times as a sustainable method for managing termites. Reports that baiting is not cost efficient or frequent. This case study performs an analysis on the economics of running termite baiting in the city of Manila, Philippines. The article finally shows that inherent characteristics of the local market help make termite baiting not only a stand-alone and successful technique but also sustainable in generating profit for the practicing practitioners.

Key words Termite baiting, Southeast Asia.

INTRODUCTION

Termite management is the largest urban pest control activity in South East Asia. The gross damage termite cause in this region has never been estimated, but figures for the amount spent on controls could be in millions of US dollars. Though in general termite control remains an industry formalised work, where majority continue to treat soil for remedy, alternatives methods of treatments have appeared in recent times. Termite baiting is one such method, which was introduced to the Asian market in the early part of 2000. Since then it has evolved as a sustainable method for managing termites. However reports that baiting is not cost efficient and expensive is frequent. On the contrary this author estimates in the Asian cities termite baiting has taken over 25% of post construction termite control job based on gross revenue.

Termite baiting has proved to be popular and also sustainable and profitable among new generation practitioners. Their successes are due to a number of characteristics unique to Asian cities and are as follows: High prevalence of termites; higher density of buildings and structures; absence of mandatory termite proofing of structures during construction; presence of large number of commercial structures with common partition wall/fire wall separating buildings; lack of slab-on ground type of floor construction; frequent use of non-resistant timber in construction; commonness of above ground infestation; presence of *Coptotermes* as the major termite pest species; large number of new generation pest control operators (less than 10 years old companies); and favourable cost benefit ratio.

This paper reviews and examines each of the above characteristics in an Asian city such as Manila, in order to show controlling termites by baiting is sustainable and profitable method for practitioners.

MATERIALS AND METHODS

The data and information were collected by literature surveys and conducting interviews with responsible persons such as builders and pest control practitioners. Where ever needed surveys and experiments were conducted.

High Prevalence of Termite in Existing Buildings

To determine the prevalence of termite in existing structures, two trained personnel were asked to walk through a 500 meters of a popular avenue in the central business district of Makati City, Manila. A total of 80 buildings were covered in this survey. Both personnel were specifically asked to meet/contact the responsible person of each building such as owner/caretaker or housekeeper/maintenance staff and determine the following: presence of active termites in any part of the building; previous record of termite infestation; whether termite control action was undertaken.

High Prevalence of Termite in Soil

To determine the prevalence of active termites in soil, a second survey was conducted using a single pest control company. Exterra in ground baiting stations provided by Ensystex Philippines Inc. were used for this purpose. Five hundred (500) in-ground stations containing wooden interceptors were installed and monitored for termite activity. The stations were all installed between the months of February to May 2012 covering 28 properties. The stations were monitored and the data presented here accounted for the first 3 months of activity.

Determining Termite Species Infesting Structures

A single pest control operator took part in this work over a period of 4 years between 2005 and 2009 to determine the dominant species infesting structures in Philippines. A total of 450 infested structures formed part of this survey. Data were collected during the survey and inspection of the infested structures. During inspection samples of live termites were collected for identification. Once identified the information was tabulated in 2 categories, namely belonging to higher and lower group of termite. Higher termite species included, *Microcerotermes losbanosensis*, *Macrotermes gilvus*, and *Nasutitermes luzonicus* and lower included *Coptotermes gestroi*.

Commonness of Above Ground Infestation.

In the above survey information on the method of entry into the structure was also investigated and noted. Entries were categorised as above ground when evidence pointed to clear termite entry from an above ground source such as a planter box, roof gardens, adjacent tree touching the building, mound along the building wall or from a temporary constructions touching the main structure. Rest of the entry were all marked as below ground.

Determining Cost / Benefit Ratio

A single pest control operator making use of termite baiting as his principle method agreed to take part in a survey to determine the economics of termite baiting system. Data was gathered on a number of parameters to check the cost benefit ratio of running a termite baiting system.

RESULTS AND DISCUSSION

High Prevalence of Termite

The survey covering 80 individual buildings in the central business district of Manila revealed 42.5 % buildings had some type of termite infestation either in the past or having an existing infestation. Seventy two (72) buildings out of the 80 reported that they have undertaken termite control action both in the past and in the present, to contain termite infestation.

The results of the experiment to determine the prevalence of termite activity in soil is summarised in Table 1. The data presented show 20% of the installed in ground baiting station intercepted termite colonies in 3 months. The major species in the soil was *Macrotermes gilvus* followed by *Microcerotermes losbanosensis* and *Coptotermes gestroi*.

Table 1. Interception of termite species by using In-ground Bait stations (IGS).

Number of IGS	No interception	<i>Coptotermes gestroi</i>	<i>Microcerotermes losbanosensis</i>	<i>Macrotermes gilvus</i>	<i>Nasutitermes luzonicus</i>
500	80%	1%	7%	11.8%	0.2%

The survey conducted on 450 infested structures showed *Coptotermes gestroi* as the major termite species. The number was significantly higher than other species. Also this species was significantly more common in urban areas compared to suburban areas, where there is more number of infestations from higher group of termite species (Table 2). Analysis also show structures located in suburban areas have significantly higher number of above ground entry compared to urban areas. Consequently structures in urban areas have significantly higher underground entry compared to suburban areas.

Cost / Benefit Ratio of Termite Baiting

The various parameters determinant to run a termite baiting system is shown in Table 3. The total business of the company using baiting for 2012 was recorded to be PHP 6 million. Cost of labour was computed to be 12.5%. After deducting all expenses the net profit from this venture is calculated to 43.75 %.

Table 2. Termite species, location and entry method for 450 infested structures.

Parameters	Urban	Suburban	p value
Species			
Higher species	67	95	<0.0001
Lower species	226	62	
Method of Entry			
Above Ground	39	123	<0.0001
Below Ground	254	34	

Table 3. Cost of termite baiting for a single pest control practitioner for 2012.

Itemized incomes	Itemized costs	Itemized Amount collected (in Peso)
New Linear Meters (LM) of business sold in 2012		4,800,000
Linear Meters Renewed from previous years		1,200,000
Gross Business from Termite Baiting for 2012		6,000,000
	Cost of Products	2,200,000
	Cost of Labour (2 teams with 2 technicians, working 8 hours a day, 5 days a week)	750,000
	Annual cost of Fuel/Car maintenance (covering an average of 100 km a day for the 2 teams)	325,000
	Others Expenses	100,000
	Total Expenditure	3,375,000

Since the removal of organochlorine compounds, long term termite control of structures relied on continuous maintenance and monitoring. It became imperative that termite management program need sustainable methods which will combine cost, termite elimination and environmental concerns together. Termite baiting soon found its position in the market as it combined all three concerns. But soon reports surfaced that baiting is not cost efficient and less profitable, in addition to it being slow acting and the method of treatment does not leave residual effect on the treated zone. Most of these concerns were expressed in North American termite control market. However termite baiting found favour and became popular in Asian cities such as Manila due a number of inherent characteristics of the market. Manila a metropolis with its dense population of 43,079 inhabitants per km² presents a large concentrated termite market for practitioners. To keep up the growing population, buildings are regularly constructed. As an example the National Statistical Office (NSO, 2013) reported 13,378 approved building permits for residential and non-residential structures for the year 2011 in the national capital region of Manila. This number is 11.9 % of the total number of approved building permits for the country. The number also constitutes an estimated 6.3 million square meters of floor area which represents 29.5% of the total floor area for the country. Added to this total would be another estimated 2 million square meter of approved building permits for commercial and industrial types (NSO, 2013). Consequently Manila has become a focal place to run a termite control business due to favourable economics. Surveys have shown buildings are being built without specific building codes necessary for preventing termite infestations, in spite of high prevalence (Table 1). Studies have shown that a quality concrete slab can work as barrier against termite and in its absence structures are vulnerable to infestation (Schafer and Guirguis, 2003). Surveys by this author has found absence of quality concrete slab or using underspecified concrete slabs, thus increasing the probability of termite entry into buildings through future cracks. Also lesser use of a slab-on-ground floor types and preference for sectional slabs for residences adds up the chances for gaps and termite entries. Use of non-resistant timber in structures and decorations such as baseboards and wall cabinets are also a reason for initiating infestations.

It is noticeable that in Asian scenario customers call for termite control when a live infestation is detected by them. Very less interest is shown by the customer for prevention or using a termite management in the absence of termite infestation. Presence of active colony helps the process of baiting as the practitioners instantaneously install an above ground baiting station and drastically reduces the time for colony elimination by ensuring quick dispersal of active ingredient into the colony. Baiting is an attractive form of treatment for the existing colony and favour practitioners by saving time. Prevalence of *Coptotermes* as a major urban species infesting buildings in urban Manila also favour the use of termite baits (Table 2). The species presents a unique advantage as they feed easily on processed cellulosic bait and can be suppressed and eliminated quickly from a given structure. Amount of bait consumed by the species is also significantly less compared to other species, thus making the work of a practitioner economical. Studies by the author have shown that structural activity of *Coptotermes gestroi*, the dominant urban termite in the Philippines, can be suppressed and eliminated in 12 weeks. Further evidence of this observation is supported by studies conducted by Garcia et al. (2007). The time could be further reduced by replenishing the bait more frequently, compared to the conventional method of once in a month which is generally practiced by practitioners. Colonies of higher termites may however take more time (Dhang, 2011).

It is true that the process of baiting does not leave a residual effect in the soil as compared to soil treatment. This is a significant disadvantage. To overcome this gap a monthly monitoring of

the structure is undertaken by the pest control operators in running a baiting program which provide the much needed replacement for residual effect needed in termite management. Realistically it is accepted in the local industry that it is near impossible to create a full proof chemical barrier around a structure knowing termites could use a number of strategies to penetrate. However a monthly monitoring performed under termite baiting program based on inspecting of all in ground stations, collecting client feedbacks and check on alteration to the structure provides a better option to keep a check on the termite activities and longer protection.

As the on-going structural protection depends upon diligent monitoring for new evidence of termites in the future, it is often thought such program would be expensive to run. The cost benefit ratio as presented in Table 3 clearly shows that practitioners with large number of customers could easily restrict the cost of labour to 12.5% in running a baiting program. Similarly practitioners with limited customers have made the baiting profitable by focusing their business in a specific zones or areas of the city. This significantly cuts down cost of labour and time.

New generation practitioners have realised that treating termite colonies is the best method to eliminate the pest from structures. This realization has helped popularity of termite baits and non-repellent chemicals. However baits allow quick and sure dispersal of active ingredient into the colony compared to non-repellent termiticides. Baits are specifically added in aggregation devices either installed over an active site or installed in the ground. This makes the process more precise and prevents overuse of chemicals in urban environment.

REFERENCES CITED

- Garcia, C.M., M.Y. Giron, and S.G. Broadbent, 2007.** Termite baiting system: a new dimension of termite control in the Philippines. Proceedings of the 38th International Research Group on Wood Preservation, Wyoming, USA, May 2007, pp 12.
- Dhang, P. 2011.** A Preliminary Study on Elimination of Colonies of the Mound Building Termite *Macrotermes gilvus* (Hagen) Using a Chlorfluazuron Termite Bait in the Philippines. *Insects* 2011, 2(4), 486-490.
- NSO, 2013.** National Statistics Office, Republic of Philippines.
<http://www.census.gov.ph/statistics/administrative-based/construction>
- Schafer, B. and S. Guirguis. 2003.** Concrete Slabs and Subterranean Termites, Paper presented at the CIA Biennial Conference, Brisbane 2003.
<http://www.concrete.net.au/publications/pdf/Termites.pdf>