

Professional Termite Management

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Abstract – Termite is a destructive insect. They can negatively impact human welfare by causing damage to our property i.e. unprotected cellulose materials, timber structures etc. On the other hand, Termite is called as an essential member of the soil ecosystem and is found throughout the world. In their natural environment, they improve soil.

The number of systems, application techniques and products are available for termite control. Pest Management Professionals (PMPs) is only familiar with the treatment used by them. The professional practice of pest managers i.e. (PMP's)/contractors/ agencies to eradicate the problem of termite with different measures/methods called termite control.

Considering the population strength and the destructive power of termite, total control of termite is not possible for any professional. Due to the limitations of control measures, it is difficult to have total control on termite and hence using skillful management techniques are very much essential for effective termite eradication.

Keywords – Termite management, Cellulose Material, Pest Management, PMP's.

I. INTRODUCTION

TERMITES are insidious considerable damage to wood-work & furnishings in buildings. The losses due to termites are estimated to be as high as 10% of the capital outlay on building.

In India, the most important species are those belonging to the group of sub-terranean species, which have their main colonies underground from where they travels long distances in search of cellulose food materials such as Timbers, Paper, Cloth etc.

The propagation of termite colonies take place generally during the rainy season when at certain optimum moments say a clean evening after rains, the macropterous reproductive forms swarm out from the termite nests in very large numbers. A large variety of termite species have their nests several feet deep below ground surface and it is the workers from these nests which come up and forage for long distance and are found destroying valuable crops.



Fig.1.

The difficulty, however, is that fresh batches of termites continue to come up from a large number of nests where the Termite queen/ Queen Ant of single nest is laying upto **30000 eggs per day**.

Termites are sometimes called white ants and can often be seen in large numbers in logs in the forest or in wood lying in contact with the ground or in the timbers of buildings.

The Biology and Colony Formation of Termites:

Wood is made up chiefly of cellulose, a large complex chain of relatively simple chemical molecules. Few animals have the necessary body chemicals (digestive juices) to break down cellulose into smaller more usable nutrients.

Termites plus their helpful protozoa can do this. Cattle eat grass (which is primarily cellulose) and are helped by similar microorganisms to break down the cellulose into simpler compounds, primarily various sugars. Humans do not have the right kind of micro-organisms in their digestive tract to break down cellulose and therefore cannot digest cellulose, although we do eat many plant products which contain cellulose, such as lettuce and celery which, in the form of cellulose, is called "bulk" or roughage in our diets.

Termites in the colony are divided biologically into three basic groups: reproductive forms both winged and wingless; numerous sterile soldiers that are always wingless; and workers, wingless also.

"Members of the Termite colony"

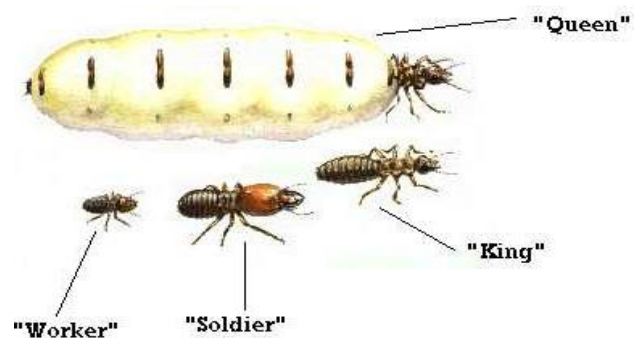


Fig.2.

The reproductive that are winged, known as elates, are the primary swarmer. They are the potential kings and queens. They also are the members of the colony that are most likely to be seen by the homeowner.

The homeowner most often confuses these winged termites with winged ants, but differences between them can be observed. In the termite, the abdomen is broadly joined to the thorax (similar to a grain of rice) whereas in the ant, the thorax and abdomen are joined by a narrow waist. The termite also has straight bead-like antennae whereas those of the ant are elbowed.

Termites and Their Environment:

Subterranean termites are capable to a limited extent of regulating temperature conditions of their environment, to suit themselves and the colony.

Their burrowings often are situated so that some run above and some run below the ground, therefore providing burrows situated some distance below ground in more equitable temperature conditions where termites will be found during extremes of cold or hot weather. Non subterranean termites cannot regulate the temperature of the colony since it is located entirely above ground.

Subterranean termites need a constant, ample supply of moisture. Part of this moisture is obtained from the products of their own metabolism and part from soil moisture which diffuses through their tunnels or tubes.

The subterranean termite colony usually obtains its moisture from the soil and is greatly dependent on soil types. Moisture in clay soils is tightly bound to the particles and not readily available to the termite, whereas sandy soils allow the moisture to be available to termites. Thus termites are more prevalent and able to survive better in sandy soils.

Subterranean Termite:



Fig.3.

Basic Difference between Subterranean and Non Subterranean Termite:

Subterranean Termite: Subterranean termites, however, nest in the soil in order to have access to an adequate source of moisture. They bring this moisture from the soil up into the wood to maintain a relative humidity of greater than 90% in the infested wood. Because of this high humidity, it is often difficult to tell the difference between wood decay and insect damage.

- The lifecycle of both the categories are same.
- Subterranean termite prefer to stay in soil and build their mound i.e. soil nest. They get attracted to moisture.
- They destroy not only the wooden material but all kinds of cellulic material.

Non-Subterranean Termite:

- Non Subterranean termite lives inside the wood.
- They grow their colony inside the wood. They do not require moisture.
- Their main food is wood.

Wood-Destroying Insects:

Wood-destroying insects are well adapted for the destruction of wood and wood-based products. Many of these pests attack logs or diseased/dying trees in nature,

the adults may sometimes emerge from, or the damage may be noticed in, seasoned (dry) wood or furniture in buildings. Many of these insects cannot reinfest the wood and control is not necessary. Most of the pest which attack dry, seasoned timbers live entirely inside the wood for most of their lives.

Damp Wood Termites



Fig.4

Dry wood termite



Fig.5.

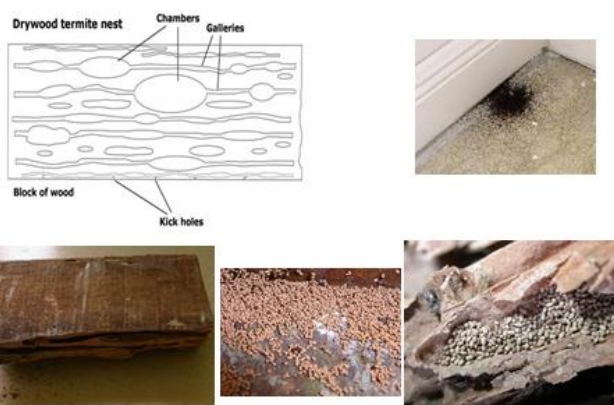


Fig.6.

Code of practice of termite control measures :

"Indian Standard" (IS) means the standards (including any tentative or provisional standards) established and published by the Bureau, in relation to any article or process indicative of the quality and specification of such article or process.

Code practice for termite control measures (Indian Standards), is a parallel 'semi legislature procedure adopted and implemented by the Government-Semi government Organisations, Industries, Private Sectors etc.

Wood Borers



Fig.7.



Fig.8.

The current rules i.e. ‘The Code of Practice for Anti Termite Measures in Building’ i.e. IS 6313 part I, II & III was first introduced in the year 1971 and then in the year 1981 & 2001, the authorities published and issued the revised edition with some changes in Termiticides with their dosages.

Termiticides: The Insecticides used for the control of termites is known as ‘termiticides’, and there is a huge demand for these termiticides all over the world. These termiticides have been used effectively to avoid the damage caused by termites to the national property.

The role of Pest Management Professional i.e. Pest Control Operator (Pest Control Company) is:

- To restrict the entry of Termite through the foundations and to create an un interrupt barrier of termiticide at each soil contact with the foundations (i.e.at all entry points),
- To develop and establish appropriate and correct methodology of termite control measures with the knowledge of ‘Termite with its all species’ considering its biology, life cycle, food and damage to the structure and environment by implementation of management skills with reference to the Label of available Termiticides.
- To understand the damage and loss to the structures and the environment caused by Termite. If it is a new structure, study and understand the types of structures and the sections of buildings as well as identify the soil contact and entry points of termite in to the structure.

It is necessary to create and establish new methodology for ‘Termite Management’ with different ‘Skills’ and ‘Techniques’ considering the advance constructional practices.

The professional pest manager shall identify and understand the different foundations and the structures viz.:

- Masonry Foundation structure
- R.C.C. Foundation structure
- Pile Foundation structure
- Basement structure
- Earthquake resistance structure
- Basement with Pile Foundation structure
- Wooden Structure
- Crawl Space Basement

Entry of termite in building

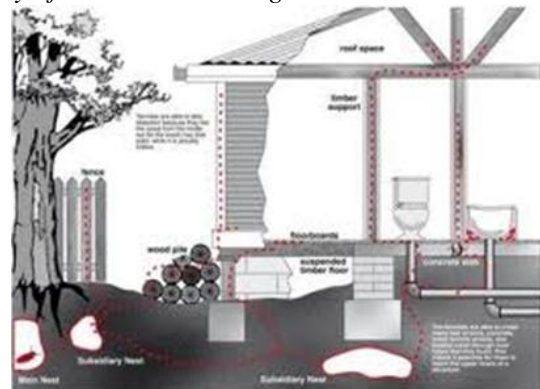


Fig.9.



Fig.10.

The termite management activity is also divided in to two parts:

1. Termite Management in Agriculture areas and
2. Termite Management in Non Agriculture areas i.e. Structural Termite Management.

Termite management in structures includes:

1. Pre Constructional termite treatment (New Constructions):
 All the treatments recommended in Indian Standards 6313 part II considering each section of foundation of respective structure.
2. Post constructional termite treatment. (Existing Structures)
 - Drilling treatment at internal as well as external area of the building.
 - The same treatment for all the affected spots.

3. Wood preservation i.e. termite management in wood and wooden material: Oil based pre-treatment by brushing as well as spraying treatment with pressure pumps.
4. Termite Management in Landscape areas (includes termite mounds):

- Destroying of termite nest or mounds,
- Creating a chemical barrier on the entire soil surface area before plantation,
- Treatment for new foreign soil

Termite infestation (actual site photograph)



Fig.11.

Code of practice i.e. Bureau of Indian Standard Procedures:

With the help of Indian Standard's publication i.e. code of practice published by Bureau of Indian Standards, all the professional pest control practitioners manages to control termite problem in different areas.

Since last 15 years, there is a drastic change in construction industry. New designs with high rise vertical sections and underground usage of buildings may require the additional precaution and the protection from proposed termite damage. Considering the changes of constructional practices every year-every day, we will find that there is tremendous change in structures, building elevation, techniques of construction of buildings and simultaneously there is a great need to improve the methodology of termite management in new as well as old building/structures.

Current termite control measures are not sufficient and does not suits to the requirement of advance constructional practices viz. Multi Basement structures, Multi floor structures with special foundations, Earthquake resistant structures etc.

Wrong treatment at wrong stage does not create a proper chemical barrier at the structure and hence there can be the heavy infestation of termite to the building as well as all kinds of cellulose material.

The Professional Pest Manager:

- Who is having Pesticide License.
- He should have his registered office with godown.
- His Company shall have the membership of any Pest Control Association.
- He should have trained staff with him.
- He should attend educational training courses and conferences.
- The Professional Pest Control operator shall have knowledge and deep study of 'Termite', its life cycle, damage, habits and entry in building as well as the knowledge of termite management in new and old buildings.
- He should know the different sections and the foundations of the building.

- He should understand the active ingredients of the respective termiticides and the dosages as well as the effectivity for termite control alongwith the mode of action of termiticide, its residual effect and the repellence before the use.
- He should follow all the safety norms at site in the point of view of Clients, Site Staff, Workers and his own operators.

Integrated Termite Management:

This area specializes in finding non-toxic and least-toxic Integrated Termite Management (IPM) solutions. The termite infestations can be avoided with the Integrated Approach in the first place.

Use of non-cellulosic material in construction activity, avoidance of leakages, moisture and damp areas within and around building, Chemical-free design and construction measures etc. can physically hinder termites and other pests from entering a home in their search for wood and wood-based materials to eat.

While subterranean, dampwood, and drywood termites are unique in their nesting habits, food sources, and moisture requirements, the following measures should significantly reduce the possibility of infestations from any type. As a general rule, implement measures that eliminate excess moisture, available food, and physical termite pathways.

Use of Alternatives to chemical barriers:

- Toxic baits, biological controls, and physical barriers.
- Piping treatment: Piping system can use to create limited chemical barrier under the structure.
- Termite bait station: The aim of baiting technology is to kill the termites. All wood products contain cellulose, which termites need as food. A wood source is placed in a bait station. As worker termites feed on the wood and when termites begin to "hit" the wood in the bait station and it comes in contact with toxic bait. Termites feed on the bait and return to the nest, distributing the food among family members. When workers consumes sufficient quantities of the toxicant, they die.



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