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Technical User Manual – For Professional Pest Technicians

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TermatriX Termite Monitoring and Colony Elimination System

Sherwood Chemicals PCL has developed the TermatriX Termite Elimination System as the latest 6th generation system to offer skilled Professional Pest Managers the required tools and freedom to revolutionize the next era of termite baiting.

The new TermatriX in-ground (IG) station design features a combination of wood/cardboard and compressed cellulose tablets resulting in a significantly far greater surface feeding area for increased termite numbers and ultimately efficacy as discovered in recent published papers by the CSIRO's Dr Theo Evans of Australia.

TermatriX Termite Elimination System Components



TermatriX Termite Elimination System Components

1. 10 x Inground Stations (included)
2. 10 x cardboard and monitoring tablets (included)
3. Hardwood timber blocks (purchased separately)
4. Replacement monitoring tablets (purchased separately)
5. In-concrete lids (purchased separately)
6. Termatrix bait 20 x 100g pack or 3kg bulk pack (purchased separately)
7. Above Ground station including 100g Termatrix Termite Bait (purchased separately)

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Termite Biology

Termatrix Termite Management System

Termites: Your Worst Nightmare

Facts you should know about Termites

Termites are sometimes referred to as 'white ants' because of their size and ant-like appearance. Termites eat wood because of the large amount of cellulose contained in the wood; however they also will eat any other matter that contains cellulose, including paper, cloth, carpet and furniture. Before you realise termites have invaded your home, extensive damage has already commenced. In Australia alone, the damage caused by termites exceeds \$780 million dollars a year and this damage is typically not covered by a standard homeowners insurance.

Termites can cause devastating financial and social implications for building owners.

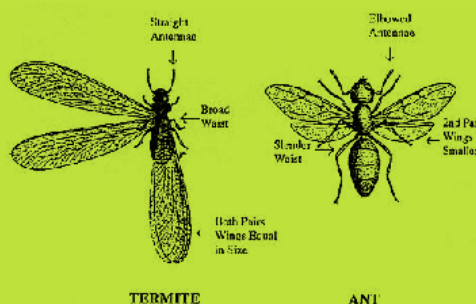
What do termites look like?

Termites are often mistaken for flying ants, but there are noticeable differences:

Both swarming termites and ants have two pairs of wings. Termites front and hindwings are the same shape and size. However, ants front wings are larger than their hindwings.

Ants' antennae are elbowed, while termites' are straight.

Ants have a narrow, pinched waist, while termites' waists are thicker and less defined.



Termites Are Social Insects

Termites are social insects. Like all other social animal including humans, termites have two distinct characteristics; division of labors and nurturing for the young ones. In a human society, there are doctors, lawyers, accountants, hard labors, carpenters and so on. Each group of professionals plays its own role in the society. Similarly in termites, members of a family are divided into 3 groups according to the function they perform. These groups are; reproductives (individuals that can mate or produce offspring), soldiers (to protect the nest) and workers (to gather the food).

Termite Colony

A family of termites is usually referred to as a Colony. A large termite colony can have hundreds of thousands to millions of individual occupying areas of up to an acre. Smaller colonies may contain less than 10,000 individuals foraging an area no bigger than a normal bedroom.

The Reproductives

The reproductive members include the Queen, the King, the immature reproductives and the winged termites. Of these, the Queen is the core of the family and every individual in the family is produced by it. The Queen may live up to 25 years and lay more than 2,000 eggs per day. The Queen also regulates the entire life of the colony. The King's function is just to mate with the Queen.

After a termite colony reaches a certain size and food source is insufficient to support further growth of the colony, the Queen would produce developing (immature)

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reproductives. The immature reproductives would grow wings and later grow to be the winged termites. Winged termites are often referred as swarmers because they would swarm out from the nest to look for a new site to establish a new termite colony. The wings break off shortly after landing and a pair of wingless termites will become the new Queen and King of a new colony at a new site.

Soldiers

Soldiers are the defenders of the colony. They protect the colony against intruding ants or termites from others colonies. Usually, this group of termites make up of 10 to 15% of a population in a colony. Soldiers are sterile (cannot reproduce) and blind. Due to their giant size mouthpiece, they also cannot feed directly and have to rely on workers to feed them.

Workers

Workers are the only termite members that damage our wooden structures by feeding on them. They are responsible for all labors in a colony. They take care of young termites, repair nest, build foraging tunnels, locate food, and feed other members including the Queen and King of a colony. Like soldiers, workers are also sterile and blind. They usually make up more than 80% of a colony population.

Nest

As a social insect, termites build nests. The termite nest is the center of a colony and inside it is situated a royal chamber where the Queen and the King live. From there tunnels are built by the workers for foraging and transportation purposes. Although most of the termite species build their nest underground, some species build their nest on trees whilst others build their nest above ground (mound or arboreal).

Mud Works

Termites live entirely in an enclosed environment. When termites forage above ground, they must maintain their connection to the soil so that the workers and soldiers can return periodically to replenish their body with moisture. Mud tubes provide termites with the soil connection. If a tube becomes damaged, workers will labor desperately to repair it. If the tube is beyond repair, termites located above ground will die of dehydration. So, in order for them to survive above ground, termites will build an extensive network of mud tubes or mud works. Mud works are early indications of termite presence in our property.

Termite Food Source

All termites eat Cellulose in its various forms as plant fiber. Cellulose is the structural component of the primary cell wall of all green plants. Thus, woody plants are naturally the primary food source of termites. Consequently, any product made of wood and to some extent cotton are food sources of termites. These include wooden door frames, window frames, parquet, cardboard, paper products, cotton clothing and so on and so on.

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Termite Identification

There are over 300 species of subterranean termites found in Australia but only around 30 would be considered pests of timber in use. It is helpful to know the termite genus in your area and be able to distinguish the species as this will aid in understanding the behavior when preparing a termite baiting program.

Common Termites found within Australia

- **#*Coptotermes acinaciformes***: is found throughout mainland Australia and is the most destructive of all species of termites. Length is approximately 5.8mm. Colonies often nest in trees or stumps but can also form nests above ground. Will form sub-colonies in buildings and will mud pack in and around timber damage. Termite workings can appear grooved in areas of active feeding.
- ***Nasutitermes***: Several species of *Nasutitermes* can damage timber in use. Soldier termites are distinguished by their pointed heads. *Nasutitermes exitiosus* usually build a low mound and is more common across South Australia. *Nasutitermes walkeri* builds part of its nest on tree branches with the rest constructed in the soil beneath the tree. This genus will mainly attack hardwood such as fence posts and timber decking.
- ***Mastotermes darwiniensis***: referred to as the giant Northern termite is found mainly north of the Tropic of Capricorn. Approximately 12.25mm in length. Sub interconnecting colonies are common making control difficult and large destruction of timber in short timeframes is typical of this species. *Mastotermes darwiniensis* typically devastate buildings, bridges, poles, trees and crops such as sugarcane. Large amounts of earth material is usually found covering activity.
- ***Schedorhinotermes***: Found throughout Australia building fragile nests in places such as old tree stumps, timber buried in the ground, in-filled patios and under fireplaces. Workings are rather brittle compared to *Coptotermes* and appear darker than surrounding soil. In timber workings the soldiers (major & minor) are less numerous than workers.
- ***Heterotermes***: are a significant structural pest throughout Queensland, northern WA and the NT. Generally they cause little damage to structural in use timber, and are typically are found in weathered timber fences, decking and posts.

*Most significant destructive termite species in Australia*

Nesting Habits

Subterranean termites can be described in 2 basic groups:

- 1) **Multi site nesters** are able to reproduce quickly so that new timber food sources become a potential sub-colony nest, possibly within the same house or area. These include (*Heterotermes*, *Schedorhinotermes*, *Mastotermes*)
- 2) **Central site nesters** have one large queen incorporating a central nest. One activity of the colony is to bring back food to the nest. They can infest multi food sources but cannot reproduce within this new food source. If a large moisture source is available within a structure, they may establish their central nest within the structure above ground, These include; (*Coptotermes*, *Nasutitermes*)

Factors that influence a termite's colony behavior include but are not limited to:

- Cellulose food sources
- Moisture
- Climate
- Geography
- Predators

Using the TermatriX Termite Monitoring & Termite Elimination System

Setup instructions for IG stations

Before you install IG stations

Before commencing with any installation an inspection should be completed in accordance with AS3660.2. A station map plan should then be drawn paying close attention to ensure stations are placed in “**hot spots**”. Hot spots are where either live termites or fresh mud works are normally found. TermatriX stations should be placed at approximately 3m intervals around the entire house perimeter in the soil directly underneath the drip-line, or away from foundation walls. Where possible TermatriX IG stations should be strategically placed in areas where termites forage in order to dramatically increase the number of station hits.

Suggested “hot spots” include;

1. Close to tree stumps, trees, wood piles and mulched garden beds.
2. Close to foundation walls and abutted to garden paths or possibly cored into garden paths or under walkway pavers that help lock in moisture.
3. Areas that contain high moisture potential around the foundations perimeter such as under air-conditioning units, hot water units close to down pipes and garden taps.

NOTE: Termites randomly forage through the soil and typically take paths of least resistance that provide safety and moisture, hence it is important to loosely pack the soil preferably with sand around the perimeter of the station.

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Sandy soils: If installing in dry sandy soils it will be easier to excavate the soil if the sand is wetted prior to auguring the hole. In addition the placement of cardboard around the perimeter of the station can keep sand from filling up the station whilst providing a cellulose attractant to entice termites.

Clay soils: If installing in clay soils a slightly deepened hole will allow for water and soil to be drained from the station. Clay soils are not ideal in areas of high rainfall as the stations flood easily, thereby possibly rendering them inaccessible by termites.

Stony soils: difficult to auger holes may require a tungsten tip auger.

The stations should be installed so that they sit flush with the surface and protect the internal station from termite predators such as ants and other invaders. All lawn thatch, gravel and mulch should be removed from the surface before the station is installed.

To assist in station identification and reporting, we recommend that a number is placed on the lid of each station using an outdoor marker pen. These station numbers should correlate to the detailed installation map for future reporting.

Placement of in-ground (IG) stations around the perimeter in the ground

Placement of stations 3 meters apart and in hot spot areas like down pipes and utilities



Installation procedure for in-ground IG stations

Step 1. Digging the hole: Using a pole digging auger of ~11cm in diameter, prepare a hole ~25cm deep. Prior to placing the station in the ground, water should be poured into the hole in order to enhance the attractiveness of the station to foraging termites.

Step 2. Timbers: Insert the desired amount of timbers. TermatriX Hardwood timber blocks can be placed within the supplied cardboard. Place the monitoring tablet directly on top of the timbers.

Step 3. Placement of stations in the ground: Termite in-ground stations are placed into the hole with the lid covering the top. Soil (preferably sand) should be loosely packed around the perimeter of the station to secure it in the ground ensuring the station sits at soil level. It is important to ensure that the station is flush with the surface and no gaps are visible that could entice other insects into the monitoring stations, just as ants.

Step 4. Monitoring stations: Stations should be checked regularly (at least quarterly) for termite activity. Each TermatriX IG station contains 3 highly palatable cellulose food sources for termite monitoring and more than twice as much cellulose material as the Exterra Termite monitoring station. The highly attractive magnet monitors should be replaced quarterly or when mould is noticeable or they appear moist.

Step 5. Inspection: When termites are found in a station, the TermatriX termite bait containing CHLORFLUAZURON 1g/kg mixed with water will be placed directly into the station ensuring minimal termite disturbance and immediate termite feeding.

Step 6. Mixing and placing the Bait: You will require clean latex gloves, a clean bucket, clean-bottled water or boiled tap water that is luke warm (due to tap water inconsistency we recommend bottled water only preferably from glass bottles) and at least ~100grams of TermatriX bait. Use the zip lock bags to mix the TermatrX bait at the ratio of ~2-3ml of water to 1gram of TermatriX Termite bait and mix with your hands to ensure the powder is a consistently moist. The bait should be placed directly into the ensuring minimal disturbance.

Installation of IG in-concrete stations in concrete pavers or asphalt

Before you install In-concrete stations

Before conducting any coring, you should locate any utility lines and pipes.

If there is insufficient soil to place a station within 500mm from the foundation wall, then you may be required to core a hole of approximately 80mm in diameter and install a termite monitoring cartridge and sealed with a standard stainless steel port cover. Do not place stations within 300mm from the foundation wall, as chemical barriers possibly previously installed may interfere with recruiting termites into the stations.

Assembling In-concrete station components

Instructions for setup of In-concrete in-ground(IG) stations: (See SET 6 above)

Each in-concrete station is ~10cm in length and 7.5cm in diameter. If additional length is required, we recommend joining two (2) cylinders together. Use one (1) monitoring tablet on top of 1 piece of wood for ease of inspection. A standard metal cap can be placed for situations such as driveways or heavy traffic, or else the plastic cylinder lid may be used.



Installation of above-ground (AG) stations

Before you install AG stations

A station map plan should be drawn paying close attention to ensure stations are placed in “**hot spots**”. Hot spots are where termites travel or are feeding most preferably attaching the station to a wooden surface where termite mud tubes are visible to ensure maximum bait uptake by worker termites. It is important to keep the moisture locked into the stations. A sealant such as **Selleys No More Gaps - Multi Purpose** www.selleys.com.au/fillers/flexible-gap-filler/multi-purpose It is a water based formulation used to make a seal of the station to the surface. Screws should be used where possible to ensure the station is securely affixed to the location.

Placement of AG stations



Additional notes on Monitoring stations and baiting

Monitoring procedure for TermatriX IG stations

A fresh pair of latex gloves should be worn when handling any station components to ensure minimal contamination.

When monitoring the TermatriX IG stations we recommend you use a torch and a clean metal skewer to view and probe the termite inspection cartridge. The termite inspection cartridge contains highly palatable cellulose tablets which will clearly indicate if termites have entered the station. As termites enter the cardboard and wood monitors in the base of the station they immediately migrate to the monitoring tablet and commence mudding up the white tablets making inspection straightforward and quick.

Part of the recommended inspection procedure is to ensure all stations are in optimal working condition. This includes the following checklist;

- 1. Remove the inspection lid from the station.** If termite workings are present, take extreme care not to disturb the workings. If no termite workings are visible ensure the cardboard and wooden inserts at the base of the station are intact and free of mould. Replace if necessary. NOTE: It is essential that no disturbance to the TermatriX Timber monitors in the stations if termites are present.
- 2. Ensure that cellulose tablets within the inspection station is free of mould,** Excessive mould will deter termites and these tablets and should be replaced as least 6 monthly or more often in wetter months in order to keep their palatability.

3 The station lid cover must sit flush with the soil surface. In some situations the hole may need to be re-augured to help create a flat soil surface where the station can sit flush with the soil.

4 Station invaders or water logging. If these issues cannot be rectified within a couple of visits it may be best to re-locate the station.

Preparing the TermatriX Bait

TermatriX bait is a highly palatable combination of alpha-cellulose and unique feeding additives with CHLORFLUAZURON (1g/kg) as its active ingredient. The use of CHLORFLUAZURON as the active ingredient in TermatriX has been proven to be the most effective performer under Australian conditions and with Australian termite species. CHLORFLUAZURON is the active in TermatriX bait and is a chitin synthesis inhibitor that effects the growth of termites as they molt.

International and local studies have shown that the addition of sugar plus clean water to moisten the termite matrix bait may enhance the feeding and acceptance of termites on the TermatriX bait. Sugar solutions should be made fresh daily. A 10% solution is commonly used which equates to approximately 100grams of white sugar to 1 litre of water. Always use water from a known source such as distilled or bottled water that is free of chlorine, pesticides or other contaminants. Technicians skilled in the art of baiting should mix the matrix to water in accordance with the varying local conditions and climate. A more wet mix for dry summer months is desirable, where 100grams of TermatriX bait is combined with 300ml of water. For cooler climates, a drier mix is desirable of around 200ml of water to 100grams of bait.

Baiting procedure for TermatriX IG active stations

When inspecting the stations during regular site visits, we recommend frequent inspections not exceeding more than 2 months depending on seasonal factors and your local knowledge. It is important to observe the following prior to commencing with the application of the TermatriX termite bait.

1. There should be **sufficient visible termite feeding or activity** in the station before commencing with baiting. There is no min number of termites required, as little disturbance is the key to successful baiting and TermatriX allows for bait to be added without disrupting termite feeding. Use your judgment to make an assessment.
2. It is extremely important that the timber monitors are not disturbed as this can break leads and lead to termites abandoning the station.
3. If active termites are visible in the inspection cartridge prepare the bait (around 100grams per active station) before removing the inspection cartridge lid and ensure that the lid does not remain off for long in order to keep moisture locked in. Simply moisten the TermatriX bait by the addition of water in accordance with the label and place the bait directly on top of the cellulose tablets within the inspection station and secure the lid. The cellulose tablets contain the same highly palatable matrix as the bait, so bait acceptance is assured. Be careful not to make the bait too wet as this may drown the termites. A wet paste is recommended.

Monitoring procedure for TermatriX termite bait

Generally if the bait is more than 70-80% consumed it should be replaced. You can use a skewer to probe into the matrix to determine the quantity of bait remaining. If the bait is

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<70% consumed the decision needs to be made as to how aggressive the termites are feeding, the species, time of year, and the time interval between the next inspection or addition of bait. Use your own judgment here.

Re-baiting simply requires additional bait to be added to the inspection station. Care should be taken to cause as little disturbance as possible as certain species of termites may abandon feeding sites if disturbed.

Monitoring intervals of TermatriX IG stations

Many factors impact the foraging behavior of termites, such as weather, season, species and disturbance. It is highly important that you understand termite behavior of the species you are baiting.

We recommend regular monitoring activity in high risk areas such as Queensland, northern NSW and other sub tropical regions. This may be monthly, or even more frequently, depending on species, degree of activity, etc. Other areas that have cooler winters may be cutback in inspection frequency.

For active termite sites we recommend monitoring intervals do not extend more than 4 weeks in summer and 6 weeks in winter. In some situations the intervals may be as short as 2 weeks. Your experience and judgment is critical here.

For aggressive feeding species such as *C. acinaciformes* or *C.raffrayi*, the interval may be shorter than the slow feeding *Heterotermes* Spp. Keep to regular standard inspection intervals and remember that stations with no food will be abandoned.

Management of IG stations

There are pests that will invade termite IG stations such as ants which will make your station highly unattractive for termites.

The most common reason for station invasion is due to poor station installation in that the station wing or top does not sit flush with the soil surface. These gaps that may appear under the station wing top allow ants to enter and occupy stations. The following are some helpful hints to rectify problems with station invaders;

- Ants – apply Anthem granular around the station.
- Wood slaters – remove from the station and replace with fresh timber interceptors.
- Earthworms – remove from the station
- Slugs – remove from the station
- Other pests – general maintenance is critical of stations.

Always pay attention to drainage issues which may have not been visual or prevalent at the time of the initial inspection. Should an issue arise, it may be necessary to relocate a station(s) and advise your client accordingly.

Inspection Findings / Client Communication

Always provide your client with a report detailing your findings from every site visit, to keep them informed of the termite pressure and your findings at their site. We also recommend that you consult with your insurer to ensure you fully comply with their requirements.

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Some commonly asked questions about Termite Baiting

Q1. How does the TermatriX bait work?

The TermatriX Termite Bait contains 1g/Kg of Chlorfluazuron as the active constituent, which is about as toxic as table salt!). As termites feed and then travel back to the colony, they share termite bait with other nestmates (trophallaxis) and send other termites back to feed on the bait. As feeding on the bait continues and more and more termites are affected, the termite colony starts to die and is eliminated.

The stages of colony elimination will be identified by the professional Pest Manager and will include; worker termites becoming creamish coloured (within first 2-4 weeks), lethargic worker termites (first 4-8 weeks), a larger numbers of soldiers termites and increased fungi in the station (final stage of elimination). From 6 weeks – 6 months depending on termite species and activity, season and size and age of termite nest.

Q2. What happens after Termites are eliminated?

After a colony is controlled the bait is replaced with new timber monitors and or the Pest Manager may recommend a perimeter chemical barrier be installed, such as a repellent-chemical barrier containing a synthetic pyrethroid chemical such as Biforce 100SC Termiticide & Insecticide or a non-repellant chemical barrier such as Fipforce Aqua Termiticide containing Fipronil active ingredient or Imiforce 200SC Termiticide containing Imidacloprid as its active ingredient. All products are very effective for a min of 3 years under normal conditions and recommendations will vary depending on the situations surrounding your property. Your pest professional is qualified and experienced with the termite and wood borer treatment for your area and property and they continue to inspect your property regularly (at least every 12 months in accordance with the Australian Pest Management Standard 3660.3) to discover any potential threat or new colonies that may invade your property.