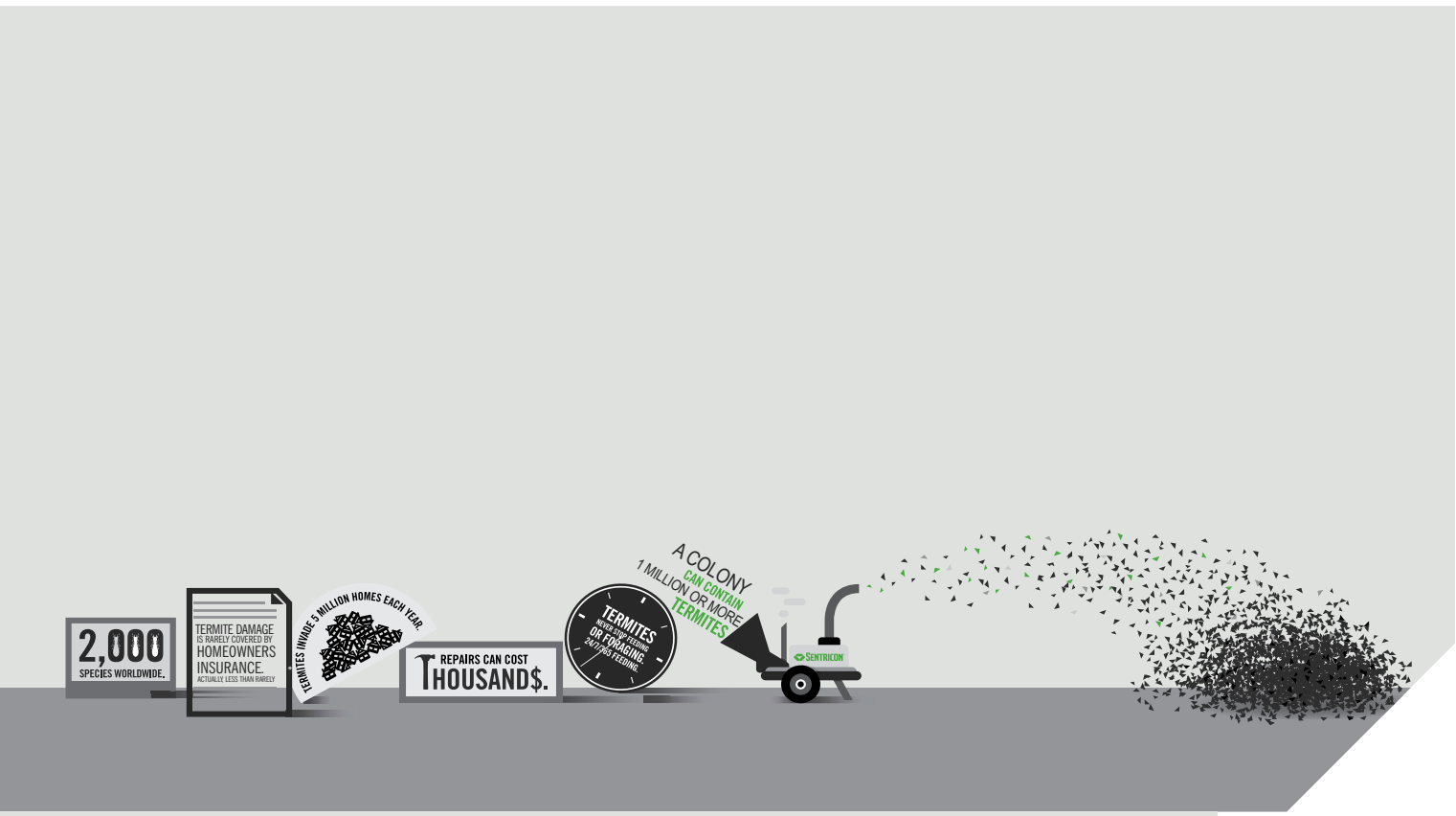
Sentricon®

TERMITICIDE

2019–20 Technical Manual



Sentricon AG Bait station and Sentricon AlwaysActive Technical Manual.

For the control of subterranean termites and the protection of structures from subterranean termite damage, in construction and post-construction.

CORTEVA™ agriscience

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The Sentricon System

Death To the Queen



THE TERMITE QUEEN IS CAPABLE OF PRODUCING A MILLION OR MORE OFFSPRING IN HER LIFETIME

Termites cost Australian homeowners more than $100 million every year, with an average of 32% of mainland homes being attacked. Eliminating termites is essential. Homeowners want termites gone and don't want them to return.

The most important attribute of hexaflumuron, the active ingredient in Sentricon, is that it eliminates the termite colony. This means that the source of the problem, or the threat to a structure, is conclusively gone.

Hexaflumuron is a chitin synthesis inhibitor which prevents termites from moulting. If a termite is unable to moult when nature intends, the termite dies.

When worker termites feed on Sentricon they pass the active ingredient to other members of their colony through a behaviour called trophallaxis. Trophallaxis is the transfer of chemical messages and nutrients between termites. It also serves as the pathway by which hexaflumuron is shared throughout the worker termite community.

Colony elimination results when the entire worker population has attempted to moult after being exposed to hexaflumuron and dies. Loss of workers in the colony means that the rest of the colony starves, as it is the workers' responsibility to feed the colony.

Other termite products may repel termites or kill individuals, but they do not address the problem. Colony elimination is essential in ensuring that the termites are gone and will not return.

Sentricon System

The Sentricon System consists of Above-Ground (AG) and In-Ground (AlwaysActive) stations.

Sentricon AG stations are loaded with a hexaflumuron bait matrix and installed where termites are known to be active. This may be within a structure, on a tree stump, on a fence, etc.

Sentricon AlwaysActive are In-Ground stations pre-loaded with hexaflurmuron rods ready for installation around a structure. They may be used in construction and/or post-construction, at active or preventative sites.

With two approaches, utilising the same active ingredient, the Sentricon System ensures colony elimination.

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Effectiveness

Most of your work comes from current customers and recommendations from them to new customers. Your reputation is critical to your ongoing success. Using a termite treatment that provides consistent results, that you can trust to eliminate termite colonies, is essential.

The Sentricon system has a research base unparalleled by any other termite management technology. Extensive field tests completed by the U.S. Department of Agriculture's Forest Service and research conducted by 30 universities and external research contractors, including Australia's CSIRO, have resulted in the publication of more than 70 scientific articles providing independently produced data on the Sentricon system providing evidence of its ability to eliminate termite colonies.

A bibliography of many of these publications is available on the Sentricon website (www.sentricon.com.au). However, if you're happy to trust one of the world's most pre-eminent termite researchers, Dr Nan-Yao Su, Distinguished Professor of Urban Entomology at the University of Florida:



Numerous studies have demonstrated the elimination of all detectable subterranean termite activity by hexaflumuron or noviflumuron baits at a variety of locations with many termite species, "to the point where citations to the published literature are superfluous" (Grace and Su 2001).

Basically, the efficacy of Sentricon has been proven in so many locations and with so many termite species, it no longer needs to be proven.

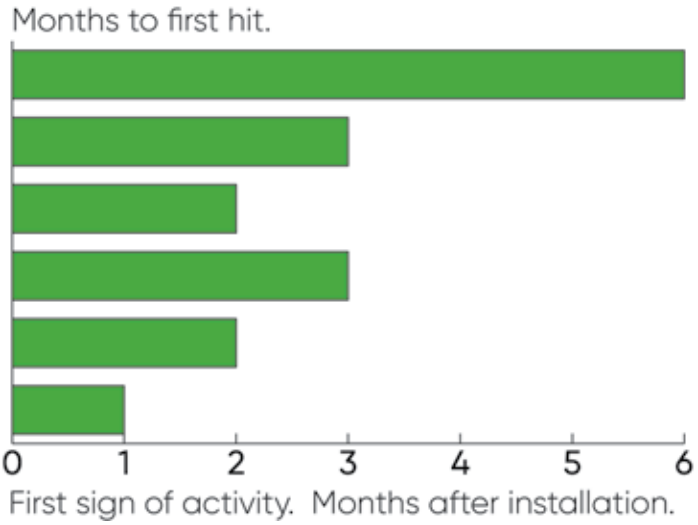
Australian Studies

Early efficacy data reported that hexaflumuron eradicated colonies of termites in Australia (Lenz, M., P.V. Gleason, L.R. Miller and H.M. Abbey, 1996) and in those cases where elimination did not occur at harvest, there was an absence of the queen, eggs and larvae while total termite numbers were much reduced. As the colony relies on the queen and brood for it's continued existence and in the absence of these critical termite life stages, the colony will self-destruct in the absence of a queen.

Lenz et al., 1996 reported that hexaflumuron is particularly effective against reproductive forms of termites so the chance of the colony regenerating is very unlikely.

Studies conducted over this period found the average time to first termite hit on Sentricon stations was 58 days (range 1-210) and average time to elimination was 97 days (range 20-260).

More recent studies using the current AG Bait matrix and AlwaysActive stations found similar results. In one study, six remedial (active) sites assessed in Australia by commercial pest control companies in the field found an average time to be hit (attacked) by termites was 2.5 months. In four of the six sites, termites hit the Sentricon stations at the first inspection.



Termite species were identified as *Schedorhinotermes* and *Coptotermes* spp. Installations occured in autumn (4), winter (1) and spring (1).

Speed of Hit

Given that it often takes around 12 months for termites to cause economic damage to a structure, achieving colony elimination within a few months is highly effective, particularly as Sentricon AlwaysActive has termiticide rods in the stations from the moment of installation, termites may be eliminated even before they are detected.

Studies comparing Sentricon to other termiticides which are faster acting have found that this can be counter productive. Active ingredients such as fipronil rely on termites foraging through treated areas and transferring the active ingredient to other colony members (known as horizontal transfer). As fipronil, and others, are dose dependent, termites that are exposed to higher doses, by returning to a treatment area and/or remaining within a treatment area, often die within the treatment area. Exposure to dead termites repels other termites from entering the exposure zone. Thus, they act similar to repellent termiticides.

Colony elimination may still occur with these active ingredients, but only where the foraging distance is short (<5 metres) and the exposure dosage is at low-lethal levels. Achieving this in practice is very difficult; the likely result is that the colony would segment and re-establish elsewhere (Su 2005). Over time, degradation of these liquid chemical treatments in the soil also reduces their effectiveness.

Comparative Studies

Ripa et al. (2007) conducted an area-wide study in five sites in Chile. Each site was at least 100 metres apart from the next site to avoid treatment interference.

Fipronil, cypermethrin and Sentricon (hexaflumuron) were evaluated bi-weekly or monthly for ~2.5 years.

Results showed that only the Sentricon system had a measurable effect on termite activity beyond several meters (at least a 15 meter radius) from the structures.

The sites treated with the Sentricon system had a significant decrease in percentage of active stations, termite numbers and wood consumption rates for the first 6 months after treatment and feeding activity at the monitors surrounding the Sentricon treatment area declined to zero and did not recover. No structures were re-infested and there were no post-treatment termite swarms for the structures treated with Sentricon.

On the contrary, no significant change in termite activity was observed for wood consumption and percentage of active stations for the other treatments.

The effects of cypermethrin were restricted to the immediate areas where it was applied. For the fipronil sites, the number of active monitoring stations only declined within 2 metres of the treated zone.

Whole System

Many studies show exceptional success when combining the power of Sentricon AG Bait stations and Sentricon AlwaysActive stations. With one active ingredient there is no antagonism between products; the whole system works together as a whole.

Having AlwaysActive stations installed as a perimeter whilst eradicating an internal infestation with AG Bait stations may also allow greater flexibility in monitoring the AG Bait stations. Commercial experience in Australia has also found that in some cases termites will leave the interior of a house to feed on AlwaysActive stations outside.

Consumption

The amount of termiticide (bait matrix in AG stations and rods in AlwaysActive stations) required for any particular site is highly specific. It will be largely determined by the termite species present (how voracious they are) and the time of the year (termites are more active in warmer months).

The location, soil type, proximity of the structure to the nest, number of colonies at the site, access to other food sources and so on, also play a part.

Every site is unique and careful monitoring of each site is essential in ensuring that you have enough termiticide available to ensure colony elimination.

The More the Merrier

Label requirements stipulate that Sentricon AlwaysActive stations should be installed at intervals of 3 metres around a structure. Where this is physically impossible, as close to this distance is required and this restriction should be noted on any documentation provided to the owner.

In addition to the minimum 3 metre perimeter, targeted station placement has been found to increase the speed to hit. Targeted placement means that in addition to a full perimeter system, with stations every 3 metres, additional stations are placed in termite conducive areas.

Research has also shown that adding auxillary stations within 30 cm of a 'hit' station can increase termiticide feeding and thereby decrease the time to elimination:

"Use of auxiliary stations improved our ability to maintain termite foraging in active stations over time by 36% and increased overall consumption of bait matrix by 41%" (Paysen et al. 2004).

The same is true with AG Bait stations. Any additional station placed where termite activity is evident will increase the likelihood of a hit.

Outdoors, termites are often found in wood-based mulch, tree stumps and wood debris. The outside foundation in closest proximity to indoor termite activity or damaged wood should also constitute a targeted placement site.

Every monitoring visit is another opportunity to look for these conducive sites and add additional stations.

Vigilance Is Key

We know it is common for two or more colonies of termites to be present around a structure.

"Most colonies appeared to be localized, occupying only a single monitoring station. Termite pressure was initially heavy, with up to five colonies present around a single building simultaneously" (Vargo 2003).

We also know that even if a termite colony has been eliminated, they will leave behind galleries making it easier than ever for a new termite colony to invade the empty nest and gallery system. This can happen extremely quickly:

"This study clearly documents that only a relatively short time (days before elimination) is needed for one colony to begin reoccupying a vacated territory and continue feeding on the same food sources" (Messenger et al. 2005).

Eliminating the known termite colony is not enough; keeping the structure protected from future attacks is also required.

Durability

Sentricon AlwaysActive rods are extremely durable.

Eger et al. (2014) found AlwaysActive rods "would be durable for at least 5 years and possibly longer under most environmental conditions."

Current trials in the US have found AlwaysActive rods remain effective for up to 11 years from the original aging sites commenced in 2007. Observations have shown degradation from the outside moving inward which is mainly degradation of the cellulose in the bait. The active ingredient (AI) has been maintained and in fact may go up proportionally as some of the cellulose degrades but the AI remains. These rods have been analyzed every year and will continue to be monitored until an 'end point' is established.

In Australia, we recommend a full review of the system every five years, to ensure the stations and rods are in good order, and that there haven't been any changes to the environment that would necessitate changes to the system.

Rods do need to be replaced when more than half has been consumed, or if they break. Beyond this, the more aged they become, the more desirable they are to termites.

In fact, the study by Eger et al (2014) determined that "termites usually consumed more aged durable bait than fresh durable bait and the differences were frequently significant".

Even when rods have been waterlogged for extended periods, research has found them to remain both desirable and efficacious.



IT'S COMMON FOR

2+ COLONIES

TO BE AROUND A HOME AT ONCE.

Safety

For Pest Managers

Sentricon AG Bait and AlwaysActive has no signal heading. Hexaflumuron is not a scheduled poison. The SDS has no safety phrases allocated. No specific personal protective equipment is required when installing or monitoring Sentricon. Gloves are recommended only to prevent transfer of human scents onto the system.

The Sentricon system is odourless. It does not require any specific measures for storage, transport or handling.

For Homeowners

Both Sentricon AG Bait and AlwaysActive rods are fully encased within their housing once installed, so risk of exposure is negligible.

Should a station be tampered with or become damaged after installation, there is minimal risk of any adverse affect to the homeowner or their family, or pets.

"The owner is very health conscious. They didn't want any dusts or foams used in their home. The health of their family and pets was a key contributor to wanting an alternative to chemicals, so we raised the option of the Sentricon system.

"We installed three AG stations inside the house and 22 external AlwaysActive stations, with a mix of in-ground and cored stations.

It probably took 2 months to get full control and we haven't had any activity since." - Termite Doctors

For the Environment

Sentricon is practically non-toxic to mammals, birds, earthworms, bees and other non-moulting insects.

Sentricon is very highly toxic to aquatic invertebrates. **DO NOT** contaminate streams, rivers or waterways with the chemical or used containers. That said, the risk to the aquatic environment is mitigated as Sentricon is fully encased in stations, so the risk of exposure is negligible.

Also as Sentricon AlwaysActive termiticide rods are so dense and durable, even in severe weather situations, when exposed to ongoing periods of wetting, the rods do not leach, ensuring the termiticide stays where it should, protect the home from termites and not contaminate the environment. It took 17 years of research and development to construct a matrix that was so durable to the elements.

The active ingredient in Sentricon, hexaflumuron, is also readily biodegradeable, has a low potential to move through soil. Bioconcentration potential is high, but the risk of this is low, based on its physical attributes, use and exposure.

"There are quite a few sensitive locations throughout our service area where the use of chemicals is just not an option. Sentricon AlwaysActive is perfect in those areas... We certainly prefer Sentricon AlwaysActive around properties due to the sandy soil in our area. We have found you don't get sufficient longevity from the chemical in the ground." - Coastal Pest Solutions

AlwaysActive

Sentricon Always Active is so specific, non-moulting insects or animals are not affected by it.

It has negligible acute and long term toxicity to humans, with no irritation or sensitisation potential. It has a very low vapour pressure so it produces no odour.

For all of these reasons, it was awarded the 2000 Presidential Green Chemistry Award for designing greener chemicals.

As it is a rod, there is no mixing or messiness involved at all. Gloves are only recommended so that you don't transfer your scents onto the rod and scare off the termites!

GREEN CHEMISTRY CHALLENGE
A U.S. EPA Program

Reduced Risk Pesticides

Sentricon minimizes environmental exposure by design, and it can be removed if desired. It was the first product registered under the Reduced Risk Pesticide Initiative of the U.S. Environmental Protection Agency as it has demonstrated:

- Low impact on human health.
- Lower toxicity to non-target organisms.
- Low potential for groundwater contamination.
- Low use rate.
- Low pest resistance potential.
- Compatibility with integrated pest management practices.

Value

The Sentricon system offers peace-of-mind unparalleled by any other termite management system. Sentricon offers:

- colony elimination
- single active ingredient system comprising internal and external stations
- more than 70 independently produced studies attesting to the efficacy of Sentricon
- ongoing client contact through regular monitoring
- AlwaysActive rods with exceptional durability ensures great value to your client
- flexibility in monitoring frequency with AlwaysActive
- fast and easy installation and monitoring, allowing time to find additional clients
- ability to engage junior staff for installation and monitoring
- a single system suitable for all situations - pre-construction, post-construction, active termites, preventative sites, sensitive zones, all soil types, etc.

Upfront costs need to be looked at with all of these features in mind.

Most pest managers who switch to Sentricon find that they have more flexibility with their labour scheduling, are able to achieve greater profit and have greater peace-of-mind, knowing their reputation, their business is safe.



"Sentricon AlwaysActive has given us a lot more repeat business, with the monthly inspections. We've noticed a difference with our workload. This year we won't have any downtime. We've taken on a lot more work.

Our profitability has definitely increased. We have more turnover. I find we can quote higher on jobs, once we explain how Sentricon AlwaysActive works. We haven't had a knock-back on a full external system yet." - Riverside Pest Management

Training

Online training is available anytime, free-of-charge on our website www.sentricon.com.au

Successful completion of our technical training is a requirement for all pre-construction installations; and it is highly recommended for all pest control managers.

Also on our website you will find a range of educational brochures, literature, tips, frequently asked questions (FAQs), etc. Testimonials from other pest control managers may help you gather ideas for ways you can expand your business.

Representatives from our team attend all appropriate roadshows, conferences and events. Make sure you make a point to come and meet us, so we can better understand your business and how we can serve you.

Face-to-face training is also available on request as required.

"Having AlwaysActive means I can have more clients. My time is free to service more clients, knowing they are protected. It also gives me more flexibility; knowing the rods are in place from installation, means I don't have to be quite as vigilant with monitoring visits. It's been a real benefit to how I manage my business, and balance that with my family." - The Termite Trackers.



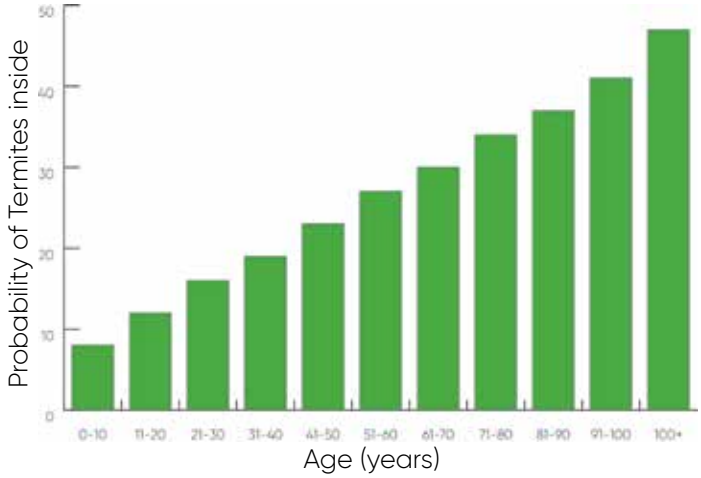
Termites in Australia

In 1996-98 CSIRO scientists Cookson and Trajstman organised a survey of 5,122 homes in Australia to determine the incidence of termites and whether there were any contributing factors to termite infestation.

Key findings were:

- South Australia had the highest incidence of termites within the home (21%), followed by Queensland (20.9%) and NSW (18.3%).
- Northern Territory had the highest incidence of termites found 'somewhere' (66.7%), followed by Western Australia (53%) and Queensland (45.1%).
- Termites were most likely to be found in walls (40%, wall frame, stud, cavity), followed by flooring (19%) and stumps (17%).
- Outside, termites were mostly likely found in wood piles/branches (31%), live trees (20%), fences (18%) and dead trees (18%).
- Most (86%) of the time, termites were found on account of damaged timber. Only 22.9% of homeowners reported having termite inspections.

House frame type and flooring type did not impact the proportion of termites found within the house; however the age of the structure did. It was found that the "incidence of termites inside increases by about 0.4%/ year."



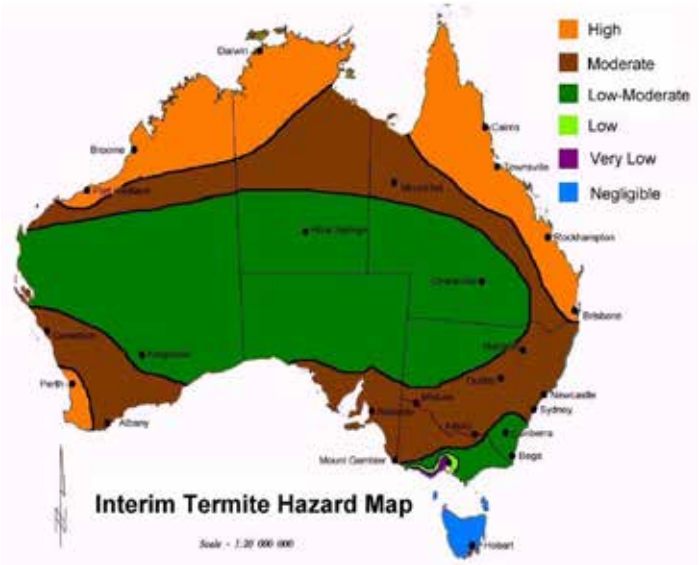
Termites Inside The House Versus Age

This data suggests that a 100-year old home has a 40% chance of having termites within the house. This currently relates to Old Colonial, Victorian, Edwardian, Federation and many California bungalow homes. Even 50-year old homes (built before 1970) have a 20% risk of having termites.

Reasons for this increased risk were related to: decay of original termite system, or breaching on account of landscaping or renovation; low floor clearance, therefore poor ventilation and inadequate space for inspections; poor quality ventilators; greater moisture through leakages; aging trees and sleeper garden beds.

These reasons may account for why termites may be commonly found in geographical areas where they may be considered to be a lesser risk, such as around the older suburbs of Melbourne.

This study produced a termite hazard map based on the incidence of termites found both inside and outside the home (below).



The dominant factor influencing termite activity or hazard is temperature. After temperature, the next most important factor appears to be rainfall.

Termite hazard tends to be higher in heavily treed areas, however, removing trees will not avoid the termite hazard and is less of a determinant as differences observed are more likely to be due to the influence of house age. The influence of soil type also appears to be less important, as termites are able to create the conditions they need within a wide variety of substrates.

However, factors such as soil type, vegetation, and age of building are likely to combine to determine the location of 'hot spots' within the broader hazard zones as mentioned above.

Termite Biology

It is important to have a good understanding of termite biology and behaviour to assist with installation and maintenance of the Sentricon System.

From a biology perspective the following external factors can influence termite colony behaviour:

- Availability of food sources (wood/cellulose)
- Moisture
- Climate
- Geography
- Predators

Termites are social insects and their colonies consist of several caste types. Being able to recognise the different caste types can be helpful. The caste types that you may encounter and their respective roles within the colony include:

- Kings and queens initiate the colony and continue producing hundreds to thousands of fertilised eggs per day.
- Soldiers are responsible for protecting the colony. Their defence mechanisms include: mechanical attack via biting with large mandibles, chemical attack by secreting toxic or repellant chemicals, and physical defence by blocking access galleries with their bodies. The head and mandible shape of soldier termites is important for identification.
- Workers make up the vast majority of the colony's mature population. They are responsible for building the nest, repairing the gallery systems, gathering food and feeding the other caste members. A colony without worker termites will die.
- Neotenics are supplementary or replacement queens. Not all species have this caste present.
- Alates are winged termites released from the colony at a particular time of year to fly off in order to find a mate and start a new colony. In Australia the two main flight periods are late spring and autumn. Nests of the same species have been known to release their alates simultaneously.
- Immature stages include all caste types that are not yet fully grown.

From a behavioural perspective, the worker termites continuously forage randomly for food sources. When termites encounter a moisture zone or physical barrier such as plumbing they are more likely to forage in and along these areas. When they locate a new food source, a feeding site is established and other workers are guided there by pheromone trails. Termites can mark sites as a potential food source, but they may not begin feeding on that site until a later date.

Termite Identification

It is helpful to know the genus of the termite in question and, if possible, the species, because species differ in biology and behaviour. There are many publications that will assist with determining the termite species. In reality you will only need to deal with a handful of different species in any one area, and with a general understanding of the behaviour and appearance of those species you will be able to make accurate identifications.

When uncertain, take a sample of termites to an entomologist, who is an expert in termite identifications. Always carry a sample container and methylated spirits to preserve the specimens for identification. Soldier or alate (winged) termites are the best caste members to collect; worker termites are generally not used for identification but can be helpful. A minimum of five termites of the same caste should be collected.



Installation

Sentricon is available in multiple convenient versions:

- Sentricon AG (Above-Ground) Bait station come with an AG station and a bag of termite bait. Refill bags of termite bait can be purchased seperately.
- Sentricon RTI (Ready-To-Install) station is pre-loaded with a Sentricon IG Termiticide Rod: recommended for new external installations.
- Sentricon two-piece IG (In-Ground) station: recommended for use in cored concrete holes. This DOES NOT include a Sentricon IG Termiticide Rod.
- Sentricon IG Termiticide Rod: recommended in situations where a Sentricon station is already installed in the ground or when installing the Sentricon two-piece IG station.

Termites are very sensitive to smell. Always store Sentricon components, both in your vehicle and in the warehouse, away from potential contaminants such as chemicals, fuel, smoke, etc. It is preferable for you to carry Sentricon components inside a sealed plastic container or similar.

Before Installation

Before installing Sentricon make sure you:

- Carry out a termite Inspection of the structure according to Australian Standard 3660.
- Ensure recommendations are made to the owner (in writing) to rectify any conditions that may reduce the effectiveness of Sentricon e.g. fixing gutters, down-pipes or leaking taps in order to reduce moisture problems from around the foundation edge; removal of alternative food sources such as tree stumps or decorative railway sleepers from the garden.
- Obtain, where possible, the termite history of the site taking note of where chemicals have been used in the past. Avoid placing Sentricon stations into areas that have been previously treated with chemicals. In these situations place the station as close to the ideal location as possible but outside the chemical zone. Look for signs of previous chemical applications such as loose earth along foundations, filled in drill holes and check the meter box for a treatment certificate.
- Identify any underground utility lines or pipes.
- Thoroughly clean your hands of all residues such as cigarettes and chemicals. These odours can deter termites. To be sure, wear disposable latex gloves.

Sentricon AG Bait Stations

Placement of Sentricon AG Stations

Sentricon AG Stations can be used just about anywhere termites are located. The success of the AG station is often determined by how well it is positioned relative to where the termites are feeding; good hit rates have also been achieved when placing an AG station over a mud lead.

It is imperative that you use termite locating skills together with commercial tools that are available such as a moisture meter, an infra-red camera and movement and sound detection devices to locate exactly where the termites are actively feeding.

Placement of the AG station should be on or just ahead of the feeding front so as to encourage termites out of the cellulose material and into the AG station to begin feeding on the bait. When moistened, the bait is pliable and can be pushed gently into the termite workings acting like a wick to draw them out into the AG station.

Termites tend to follow wood grain so bear this in mind when placing the station.

Installation of Sentricon AG Stations

Now that you have located the termites' concealed feeding front it is important to mount the AG station housing and prepare the bait matrix before exposing the termites. Exposing the termites too early will likely cause them to be alarmed and start mudding over the exit hole you have created and thus reducing the likelihood of drawing the termites out of the feeding site and into the AG station. Exposing the termites should be done immediately prior to inserting the bait matrix in to the AG station housing.

Your objective when installing an AG station is to create an environment inside the station in which termites would happily feed. This requires completely sealing the station with a sealant like Selleys® No More Gaps so that moisture can't escape and the termites can maintain the humidity and CO_2 levels inside. Sealing the station also helps to hold the station onto the termite active surface, as well as keep out predators such as ants.



Procedure to install an AG station

Carefully spread Selleys No More Gaps on the base of the AG station (Photo 1) so that a good seal will be made between the AG housing and the surface it is mounted on.



Photo 1. Selleys No More Gaps spread on the base of the AG station.

If needed, use the internal screws to hold the station to the mounting (Photo 2). If mounting onto a concrete surface where screws cannot be used, a small amount of hot glue can be used to fix the station to the concrete surface. No More Gaps can then be spread around the outside of the station to seal any air gaps. Using masking tape to hold the station in place while the sealant dries could also be beneficial.



Photo 2. Internal screws hold the station to the mounting surface.

Windows can be broken or cut out of the station to allow for it to be placed over mud leads or other obstacles. Sealant can then be squeezed around the opening to create a seal.

Other handy techniques are placing a monitoring device or two behind the AG station housing to allow for it to be mounted in places such as the edge of a door frame.

Never break open a mud lead or expose the working termites until the housing is securely in place.

Prepare the bait matrix

The bait matrix is contained within a sealed polyethylene bag inside the Sentricon AG Bait station housing. Cut one corner of the polyethylene bag containing the bait matrix with scissors.

Pour approximately 150-180 mL of sugar solution or plain water (do not use cold water from the fridge) into the bag and massage until the bait matrix is evenly wetted and becomes a doughy consistency. Add more water if necessary. Ensure that the entire matrix has absorbed some moisture so that it is no longer grainy.

The amount of moisture you add to the bait matrix will vary with climatic conditions and the moisture levels anticipated within the termite workings. You want enough moisture to encourage the termites into the matrix but not too much as it may deter them from entering. Most importantly you want the matrix to remain moist until your next monitoring visit, although generally if termites successfully hit the station this is not a problem as they will bring in more moisture if required.

Clip the bridge in place and attach the station lid.

Expose the termites to the AG Bait

Make a second good size (approximately 6 x 10 cm) opening at the back of the bag of bait matrix to make it easy for the termites to enter the station.

Use a knife or screwdriver to make an opening and expose the termites that are active in the timber.

Quickly place the prepared bait matrix, with the opening side of the plastic down towards the termites, into the AG station. Press gently on the pliable matrix and ensure some is pushed down into the termite workings as this will act as a wick to draw the termites out into the matrix.

Always leave the plastic bag in place until you are ready to re-bait. The plastic helps the termites maintain a favourable micro-environment around the matrix, assisting with rapid consumption. This is especially important in summer months.

Use the plastic bridge provided to help hold the matrix in place when on an upright surface.

Attach the AG station lid using the screws provided. To ensure a good seal place a small amount of sealant or masking tape around the edge of the lid to close up any gaps (see Photo 2). Additional sealant may also be required at the base of the AG station.

Number or mark the AG station so you can identify it next time you visit the site. Mark all station positions on your site map.

Mounting on narrow or awkward surfaces

If the mounting surface is narrower than the base of the AG station, place a couple of monitoring devices under the area of the AG station which is not making contact with the mounting surface.

Fix the AG station with the screw to the mounting surface, then fix the monitoring devices in place using sealant and possibly masking tape if they need extra support while the sealant dries. Ensure all remaining gaps are also sealed.

Variations of this technique can be used for other awkward surfaces. There are no hard rules except to

seal the AG station so that a suitable environment is created and is able to be maintained by the termites inside.

Mounting on trees

Remove outer bark layers so that the station is mounted directly onto the hard wood of the tree. Access holes will generally need to be drilled.

Mounting on a tree will make the AG station more prone to invasion by ants and other predators. Ensure you have created a good seal with 'No-More Gaps' to restrict their entry.

Cover with black plastic or a plastic container where possible to give some localised protection from wind and rain.

Mounting on painted or treated surfaces

If paint or varnish is covering a surface that termites are feeding within, it is advisable to scrape back these layers around the access hole as it may repel the termites and stop them from tunneling out into the AG station.

Remove pesticide residues from the mounting surfaces with warm water prior to mounting an AG station. This would be necessary if the homeowner has tried to 'kill' the termites in the local area with a common household insect spray.

Surfaces treated in creosote will need to have this repellent layer chiseled away before mounting the AG station.

Do not install stations onto Gyprock® unless direct access to the affected timber can be accessed. This may require removal of the Gyprock and direct attachment of the AG station to the underlying timber.

Notes on other fixing or sealing products

Liquid Nails® is only suitable for use external to the AG station. Do not make contact with the bait matrix. It can be used use sparingly to help attach stations to plastic, brick, and concrete etc, but avoid its use if possible.

Masking tape can be used to hold stations in place while the sealant dries. Ensure tape does not make contact with the bait matrix. Tape can be removed gently once fixing agents have dried to help the station mounting look neat and professional.

Silicone and putty should not be used anywhere near AG stations as they contain strong solvents which can repel termites.

Top Tips:

Check for prior treatments that may impact termite behaviour - you may need to prep the area prior to installation.

Placement where two timbers meet is ideal, preferably where galleries are evident, or over a mud lead.

Be creative, use monitoring devices (or similar) to mount stations in the ideal locations.

Installing more stations will increase the likelihood of a hit.

Seal the AG station properly - this involves good prep of the mounting area as well as sealing all external gaps.

Ensure adequate moisture in the station.

Ensure an adequate opening for termites to access the bait.

Install with minimal disturbance to termites.

Ensure no contamination - always wear gloves - if concerned, replace the bait.

Don't give up - perfecting your installation technique takes time and it takes time to eradicate a colony - call the Sentricon team if you have any concerns.

Sentricon AlwaysActive Stations

Sentricon AlwaysActive is available as:

- Sentricon RTI station pre-loaded with a Sentricon IG Termiticide Rod.
- Sentricon two-piece IG station for use in cored holes.
- Sentricon IG Termiticide Rod for situations where a Sentricon station is already installed in the ground or when installing the Sentricon two-piece IG station

To achieve a continuous system Sentricon AlwaysActive stations should be placed around the entire structure at 3 metre intervals. Where this is impossible to achieve, place Sentricon stations as close to 3 metres apart as practical.

Sentricon AlwaysActive stations should be placed in the soil 300 to 500 mm off a foundation wall. If the structure has a wide concrete path, driveway, patio or similar, against the foundation wall, it will be necessary to drill core holes through the hard-surface into the soil to install the Sentricon two-piece IG station. If this is not possible, Sentricon AlwaysActive stations can be placed along the hard-surface edge where there is a natural moisture gradient; this must be discussed with the homeowner and noted as a limitation in your paperwork.

Wherever possible, additional Sentricon AlwaysActive stations should be installed in areas conducive to termite foraging. This will increase the likelihood of the Sentricon station getting 'hit' by termites.

Conducive conditions include:

- Areas that create a zone of high moisture around the foundation edge such as: air conditioning units; hot water units; irrigation systems; down-pipes and water run-off areas.
- Edges of paved or concrete paths as moisture coming off the path makes travel for termites easier.
- Near tree stumps, trees, woodpiles or any other wooden or cellulose materials in the garden.

Installation of Sentricon RTI Stations

Sentricon RTI stations need to be placed into the soil in a hole pre-drilled with an auger. (Power augers speed up this process). They need to be installed so that the soil cover sits flush with the soil surface (see Photo 3) restricting entry of other insects, and helping to maintain conditions inside the Sentricon RTI station that are conducive to termites.



Photo 3. Sentricon RTI station correctly installed; sitting flush with the soil surface and with clearly identified station number.

Any lawn, gravel or mulch needs to be removed from under the soil cover before the Sentricon RTI station is installed. The best way to do this is to insert a small piece of wood inside the auger channel so that when the auger is turned, the wood clears a circular, flat surface for the soil-cover to sit on (see Photo 4).



Photo 4. A piece of wood in the auger channel helps clear the soil surface to create a flat base for the Sentricon station. It may also be used to clear lawn, gravel or mulch.

Push the RTI station into the hole. Sometimes it may be necessary to use a soft rubber mallet to tap the RTI station in if the ground is hard or stony.

In sandy soil it may be an advantage to pour water on the area before augering the hole. The water keeps the soil firm and reduces the tendency for the hole to cave in. The RTI station can also be wrapped in paper or cardboard before inserting it into the hole if sandy soil is proving to be an issue.

In clay soil ensure the hole is deep enough to allow water to drain out of the RTI station.



EVERY HOME IS AT RISK.

Coring concrete, pavers or asphalt

If there is no soil within a reasonable distance from a foundation edge, then a core hole through the concrete/pavers/asphalt may be required to allow installation of the Sentricon two-piece IG station.

Locate all utility lines and pipes so they can be avoided. Use a 81-83 mm core-drill bit to core through the surface to the soil. Then use an auger to remove soil to the correct depth, adding 6-7 cm to allow for any soil movement and the station cap (total of ~16-17 cm). If the concrete is too deep or the soil level is too low, add non-treated topsoil to ensure the station sits 6-7 cm below the surface.

Seal the hole with a stainless steel cap (not the usual soil cover) to restrict entry by other insects, help maintain an environment conducive to termite activity, help prevent the station from flooding as well as prevent injury to people or animals. Core caps may vary, so ensure you purchase the correct size for your core hole.

Installation into existing stations

Where a site has existing Sentricon IG stations, that have been installed correctly and are still in good condition, these may be upgraded to the Sentricon AlwaysActive system.

Open the top cap with the top cap key or pliers, remove the extractor and any monitoring devices that are present. Clean the station, using a clean-out auger if necessary, of any tree roots, dirt and debris. Remove the protective wrapper from the Sentricon IG Termiticide Rod and place it in the station.

The Sentricon IG Termiticide Rod is hard and dry, it is not necessary to add water or moisten it in any way. Replace the top cap, lock it with the top cap key or pliers, making it child-proof and pet-proof. Move onto the next station and repeat the process with all stations at the site.

Top Tips

Avoid installations in/near previously treated soil.

Stations every 3 metres is a minimum. Add extra stations in termite conducive areas, i.e. where moisture gathers, retaining walls, slab expansion joints, stepping stones, etc.

Ensure station cap is flush with soil surface.

Ensure station is not loose in the ground, employ a packing device to ensure a tight fit.

Where there is shallow soil, and an alternative location is not available, stations and rods can be cut.

Shallow trenches filled with wooden mulch across exposed, hot areas between stations will promote hits.

Making a Site Map

Mark the location of each Sentricon station on a site map.

To aid identification, it is recommended to number the Sentricon stations with a permanent marker pen designed for outdoor use (see Photo 3).

Remember to account for any auxillary stations in random 'hot spots' so they are included in monitoring visits.



Use in Construction

Sentricon AlwaysActive is an ideal construction termite management system as it:

- Adds value for the home buyer
- Allows full design scope for new builds and extensions
- Doesn't interrupt the building process
- Doesn't expose workers or others to chemicals
- Is not affected by weather
- Is visible and does not break down over time
- Can be replenished quickly and easily

Use in construction requires these conditions:

- The Sentricon AlwaysActive system is to be installed by professional pest control managers who have successfully completed on-line training provided by Corteva Agriscience (refer to www.sentricon.com.au).
- Installation must be in accordance with the current Sentricon AlwaysActive Technical Manual (refer to www.sentricon.com.au).
- A Sentricon durable notice must be fully completed (date, name and contact of professional pest manager) and permanently fixed to the building in a prominent location, such as the meter box.
- A site map indicating station locations must be provided and retained by the homeowner along with records of installation.
- Monitoring, maintenance and replacement of the system shall be undertaken by professional pest control managers who have successfully completed on-line training provided by Corteva Agriscience and be done in accordance with the current Sentricon AlwaysActive Technical Manual.

The owner of the premises assumes all liability in ensuring that their choice of pest control manager meets the above requirements. Regular site and building inspections, conducted in accordance with AS3660.2 should be undertaken by a competent person on a frequency not exceeding 12 months.

Sentricon AlwaysActive complies with the Building Code of Australia (BCA) requirements (Vol 1 BP1.1 (a) and (b)(xv) and Vol 2 P2.1.1 (a) and (b)(xv); State variations: Qld P2.1.3) via CodeMark accreditation.

CodeMark certification assures builders that the performance of Sentricon AlwaysActive meets the criteria set out in the BCA. This accreditation expires 7 November 2021.

Sentricon AlwaysActive is installed around the footprint of the structure after final grading. Building crews can stay on the job during installation, maximising construction efficiency. Plus it's a system that is maintained into the future, irrespective of changes to the footprint or landscaping.

CODEMARK™
30063

Sentricon AlwaysActive Versus Other Systems

	Sentricon	Reticulated liquid	Blankets
Accredited under Australian BCA/NCC	Yes	Yes	Yes
Eliminates the entire termite colony	Yes	Occasionally	No
Scientific studies document colony elimination	70+	<5	0
Tangible and visible evidence of protection	Yes	No	Yes
Informs future termite activity	Yes	No	No
May need booster treatments	Yes	Yes	No
May impact water sources	No	Yes	No
May be disruptive to building, lawn, landscaping	No	Yes	No
Treatment may be relocated to accommodate changes	Yes	No	No

Monitoring

Many factors affect the feeding and foraging behaviour of termites, such as: time of year; species of termite; soil structure; moisture level and disturbance. Every site needs to be judged on its own merit based on a risk assessment of the location and knowledge of the termite species.

It is important at all times to use your professional judgment of the site risks and local termite knowledge to determine actual monitoring frequency for a site.

Monitoring Tools

The following tools are recommended for you to carry with you when monitoring Sentricon stations:

- Torch
- Skewer
- Plastic recruiting container
- Screwdrivers (Phillips and flat)
- Small soft brush
- Utility knife
- Water bottle and/or mister
- Sugar for sugar water (or Gatorade is popular)
- Disposable gloves
- Top cap pliers
- Long-nose pliers
- Station cleaning auger
- Monitoring devices
- Sentricon AG Termite Bait
- Sentricon IG Termiticide Rods
- Selleys No-More Gaps
- Site map and pen

Other equipment to have available in your vehicle if required includes:

- Hand auger and/or power auger
- Cordless drill and bits
- Sentricon components
- Cardboard (to wrap stations)
- Bucket
- Mallet

Specialised pliers and augers are available from distributors.

Sentricon AG Bait Stations

Monitoring Intervals

The objective when monitoring AG Bait stations is to ensure your monitoring visits occur when approximately 90% of the bait has been consumed. For sites that have been established as a preferred feeding site and where 100% of the bait is consumed by the next monitoring visit it is common for the termites to return shortly after the bait is replenished. The key to successful re-baiting is to minimise the time between complete consumption of the bait to replacement. You need to avoid situations where the termites have vacated the area because they have had no food available for several weeks.

For an active termite site we recommend monitoring intervals do not exceed 4 weeks in summer or 6 weeks in winter. In summer, the termite active months of the year, the monitoring interval may be as short as 2 weeks if the termite species appear to be feeding aggressively. You may wish to monitor AG Bait stations 2 to 3 weeks after the initial install to gauge the level of termite activity and then decide whether to make the next interval longer.

Monitoring Procedures

Care must be taken to avoid excessive disturbance when inspecting AG Bait stations.

To open the AG station, score the sealant around the lid with a sharp knife and then, using a flat screwdriver, gently pry open the lid. Have your torch ready if you are in a poorly lit area. Quickly view the station to assess the extent of feeding. There could be as much mud as there is bait in the station. If this is the case, it is best to scrape out the mud before installing new bait.

If the termites are feeding on the bait and sufficient bait remains, quickly close the lid, reseal and make a note of the percent consumed. There will be times when you will want to restock when as little as 50% of the bait has been consumed, especially if you are not confident that enough bait will remain until next monitoring visit.

If there is only a small amount of bait remaining in the station then you will need to remove the remaining bait and replace it with new bait. Alternatively you can stack another AG station onto the first to make a larger amount of bait available. This is called a double stack.



Continue to replace the bait until there is no further feeding and no worker termites present.

How to double stack AG Bait stations

Prepare the new bait matrix first as described earlier. Apply a small amount of sealant to the outer edge of the base of the new AG station.

Do the next steps a quickly as possible to minimise disturbance inside the existing AG station. Remove the lid of the active AG station then attach the second AG station housing. When in place, quickly, but gently, remove the plastic bag that surrounds the first bait matrix and then place the newly prepared bait matrix into the station ensuring it makes good contact with the workings below.

The pliable nature of the wetted bait matrix allows it to be moulded around the termite workings to create a favourable environment for them to feed. When happy with the position of the bait, replace the lid on the stacked station, re-using the first lid as this will contain the termite colonies' pheromones. Seal all air gaps with sealant. Modify this procedure where necessary but always be mindful of working quickly and efficiently so as not to disturb the termites unnecessarily.

Sometimes you will open the AG station and find that no bait has been consumed. In these situations slowly lift the bait matrix to see if the access hole is free of mud. If not, re-open the access hole and try again to draw termites out. If after several monitoring visits this is unsuccessful you may want to consider re-locating the station to another termite active position.

If, when you open a AG Bait station, you find that the bait matrix has been either completely mudded over or has been 'peppered' over with mud dots but no bait has been consumed, this could indicate several things: the bait matrix may be marked as a food source for future use; or the bait matrix may be too dry for feeding. Re-moistening the matrix may stimulate feeding in the latter situation. The peppering could indicate that the termites have been disturbed and consequently have abandoned the station.

Sentricon AlwaysActive Stations

Monitoring Intervals

Whilst no termite activity occurs, sites should be monitored every 3 to 6 months. For termite active sites, monitoring intervals should not exceed 4 weeks during summer and 6 weeks during winter. In some situations, the interval may be as short as 2 weeks, depending on the feeding behaviour of the colony.

In the case of *Mastotermes*, due to their voracious consumption, enormous colony size, tendency for satellite colonies and the fact that they moult less often than other species, active sites should be monitored weekly and non-active sites every three weeks.

Monitoring Procedures

When inspecting an AlwaysActive station, open the top cap using the top cap key or pliers. If is often obvious if the station has been hit on account of mudding. If you are unsure, use a torch and slide a cake skewer down into the Sentricon IG Termiticide Rod to test its integrity. As a last resort extract the rod to determine the extent of consumption.

Over time, Sentricon IG Termiticide Rods may take on different colours, may crack and develop surface moulds. This is expected and is totally normal. Discoloured, mouldy or cracked Sentricon IG Termiticide Rods should not be replaced; they are just as palatable, if not more so, than new rods (see Photo 5).



Photo 5. A new Sentricon IG Termiticide Rod adjacent to a gnarly rod. Both are palatable and efficacious to termites.

Do not replace until 50% or more of the rod has been consumed.

If a Sentricon IG Termiticide Rod is more than 50% consumed it should be replaced. If less than 50% is consumed, use your best judgment on replacement, based on your customer run schedule, how fast the

termites are feeding and how much of the bait is consumed. Work as fast as possible so as not to expose the termites for too long.



Remember to always make a note of the date and how much of the rod has been consumed for each station. This is important record keeping information for supporting any future claims of colony elimination.

Continue to replace the rods until there is no further feeding and no worker termites are present.

General Maintenance of Sentricon AlwaysActive Stations

When monitoring AlwaysActive stations maintenance will be required in the following circumstances:

- The soil cover does not sit flush with the soil surface. In some situations the hole may need to be re-augered to help create a flat surface for the soil cover using the technique shown in Photo 4.
- Re-occurring problems with other insects invading the station or water-logging. In these situations it may be necessary to re-position the station away from the problem area. (Water-logging will not impact the efficacy of the AlwaysActive rod, but will prevent termites from hitting the station).

If other insects invade AlwaysActive stations

There are pests other than termites that invade Sentricon AlwaysActive stations. Some of these invaders are detrimental to the Sentricon station's performance (e.g. ants) while others appear to have minimal effect (e.g. earthworms).

The most common reason for AlwaysActive station invasion is incorrect installation of the soil-cover. Gaps under the soil cover allow entry into the station of soil surface dwelling pests. Below are some helpful hints on how to rectify problems with other insects:

- Ants are predators of termites and are therefore the most destructive invaders. The preferred way to deter ants from 'living' inside the station is to flood it with water. If this happens often enough the ants will usually vacate the area. If flooding is not successful, consider relocating the station or try a very light application of ant bait around the station. Ensure the ant bait is not applied within 5 cm of the soil cover.
- Wood slaters can deter termites from establishing the area as a feeding site and so need to be prevented from entering. Entry is usually gained via an air gap between the soil cover and the soil. Ensure the soil cover sits flush with the soil surface.
- Earthworms do not usually pose a problem and tend not to affect the performance of the AlwaysActive station.
- Slugs normally enter under the soil cover. If not managed, a AlwaysActive station can get invaded by a large number of slugs and this will likely deter termite feeding. Clean out the station and ensure the soil cover sits flush with the soil surface.

Other pests are often found in AlwaysActive stations that have not been installed correctly or maintained. These include earwigs, spiders, and tiny soil dwelling insects such as collembola (spring-tails); all of which should be managed through regular station maintenance. Clean out the station and ensure the soil cover sits flush with the soil surface.

Top Tips:

Control ant populations in and around stations as they will repel termites.

Advise landowner not to use general household insecticides near termite site.

Monitor with the least disturbance possible, especially where *Coptotermes frenchi* and *Schedorhinotermes* sp. are suspected.

Ensure all stations are checked, including auxillary stations in 'hot spots'.

Always look for opportunities for additional stations - the more stations you have, the more chances you will get a hit.

Colony Elimination

The Sentricon system has proven its ability to eliminate termite colonies. Colony elimination is what homeowners want, and what your business needs.

Signs that a colony is affected include:

- A visible cream/white colour change seen in the bodies of the termites, particularly worker termites (when viewed under magnification);
- Small white balls of crystallised uric acid;
- An increase in the ratio of soldiers to workers (approximately 6 to 1);
- Caste members start to exhibit odd behaviour and sluggish movements.

We recommend that these changes be recorded as evidence of colony elimination.

Remember to maintain vigilance however, as an empty termite nest and gallery system is an open invitation for a new colony to move in. They may even start moving in before the original colony has completely died.

Annual inspections combined with ongoing maintenance of the Sentricon system is the only way to ensure the termite queen is gone and is not coming back.



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