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Termite Baits[1]

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Introduction

Up until the early 1990s, liquid termiticides were the main treatments for subterranean termite infestations. However, the development of termite baits gave homeowners another option for controlling subterranean termites. Baits are now widely used and offer an alternative for those who may not want liquid treatments applied to the soil around their homes.

Know the Enemy: Termites

Before we start, some background on termites and termite behavior will help you understand how baits work.

What Are Termites?

Termites are small insects that eat wood and live in colonies. The colony is headed by a king and queen who mate and produce more termites. Soldier termites defend the colony against invaders and predators. Worker termites search for food and are responsible for feeding and taking care of the king and queen, the young (larvae), and the soldiers. Termites have microscopic organisms (called protozoa) living in their digestive tract that help them to digest wood. Termites are very important in nature because they break down wood and return nutrients to the soil. They become a problem only when they attack our homes and structures.

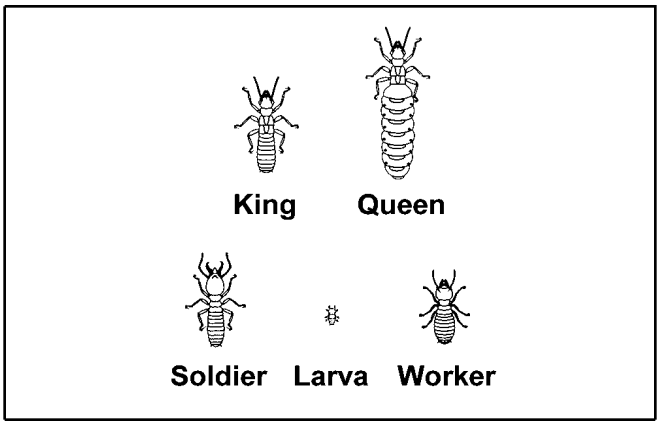

Figure 1. Some members of a termite colony: Reproductives (king and queen), Soldier, Immature (larva), and Worker. (Drawing adapted from Su & Scheffrahn, 2000. Formosan subterranean termite. *In*: Featured Creatures. http://creatures.ifas.ufl.edu).

1. This document is ENY-2001, one of a series of the Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication date: July 1998. First revision: February 2002. All graphics by B. Cabrera except Figure 1 by J. Perrier, Ft. Lauderdale-REC. Formosan Subterranean Termite, ENY-216. Please visit the EDIS Web site at http://edis.ifas.ufl.edu. Additional information on these organisms, including many color photographs, is available at the Entomology and Nematology Department Web site located at http://entnemdept.ifas.ufl.edu/

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Termite Behavior

Termites are highly social insects. Within the colony hundreds, thousands, and sometimes millions of termites work and live together. They feed and clean each other and exchange liquid chemical signals as part of their communication. They also share droplets of fluid to keep themselves supplied with the tiny organisms needed for digesting wood. You will learn that termites feeding on a bait will share it with their nestmates and end up destroying their own colony.

Different Kinds of Termites

There are two main termites in Florida that infest structures - subterranean and drywood. Subterranean termites usually live underground where they tunnel in the soil in search of wood. When searching and feeding above ground they build mud shelter tubes. Subterranean termites also cover the wood they infest with mud and use carton - a substance made from their droppings - as nest material.

Drywood termites live completely inside dead wood and never tunnel in the soil. They produce dry, gritty fecal pellets that are often found scattered or in piles near the wood they infest.

Correct identification of the termites infesting a structure is extremely important because baits only work against subterranean termites.

What is a Termite Bait?

A termite bait is usually a paper-, cardboard-, or sawdust-like material containing the active ingredient (or AI) that kills termites. The bait is kept inside a plastic bait station. As termites feed on the bait, the termite-killing AI gets into their bodies. The AI is spread through the colony as the termites feed each other. As more workers feed on the bait, more AI gets into the colony. Eventually the amount of AI in each termite increases until it kills them and the colony dies or is reduced.

Bait Stations

There are two types of bait stations: above-ground and in-ground. Above-ground stations are installed directly over shelter tubes or infested wood so that termites can begin to feed immediately on the bait.

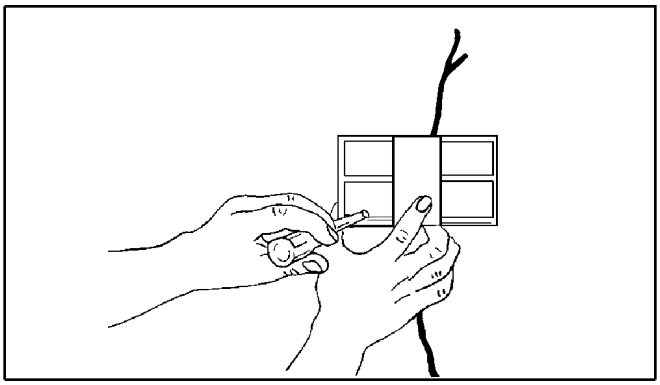

Figure 2. Above-ground bait station installed directly on an active termite shelter tube.

In-ground stations are placed in the soil. Most stations are cylindrical tubes with disk tops. The disks makes the stations easier to find and keeps them from sinking into the ground. The tubes have numerous holes or slits through which termites enter to get to the wood and bait inside.

What Makes a Good Bait?

Obviously, a good bait kills termites. It should also taste good so termites will eat plenty of it. Remember, the more bait that is eaten, the more AI gets into the termites and is shared with the colony. Effective baits should also have these qualities:

- The AI should work slowly. If not, the termites will die before they can feed it to others.
- The AI should not make the termites sick or act abnormally soon after they start eating the bait. Abnormal termites are often avoided or cast out of the colony by their nestmates. This would prevent them from spreading the AI to others.
- They should not easily mold or decay. Termites will not eat spoiled bait.

How Do Baits Kill Termites?

The active ingredient is what actually kills termites. Currently there are two types of AIs used in termite baits: stomach poisons and insect growth regulators. The two stomach poisons currently used

in baits are sulfluramid (sul-flu-ra-mid) and hydramethylnon (hy-dra-meth-il-non). Insect growth regulators are compounds that act like the natural hormones that control development. They prevent termites from forming normal cuticle (skin) during the growth process known as molting. Hexaflumuron (hex-a-flu-mu-ron) and diflubenzuron (di-flu-ben-zu-ron) are the growth regulators used in some baits.

How Do Termites Find the Bait?

Termite baits do not lure or attract termites. Instead, termites must find the bait station as they tunnel blindly through the soil in search of food. Thus termite baiting is a "hit or miss" process. However, studies have shown that subterranean termites dig a network of branching tunnels. This allows termites to completely search a given area. Eventually, they find wood and other material to feed on. Termites can begin feeding once they find a bait station. When a station is "hit," bait is added for the termites to eat.

What Is the Procedure for Baiting?

Baiting for subterranean termites is a relatively simple process. The pest management professional (PMP) installs stations containing small pieces of wood or similar material in the ground around the base of the home. These are spaced from 6 to 20 feet apart. Stations may also be placed in areas where termites are likely to be such as near tree stumps, wood used in landscaping, and in planting beds. Multiple stations are used to increase the chances that termites will find them.

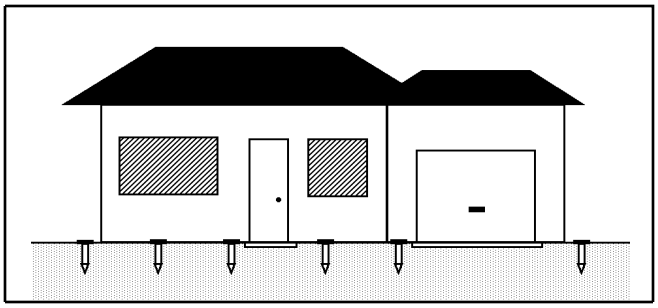

Figure 4. Bait stations in the ground around a home.

Once installed, the PMP comes on regular visits to check the stations for termites. If termites are found, a bait is placed inside for the termites to feed on. The PMP returns periodically to inspect and to add or replace baits as needed. Baiting is stopped when termites are no longer found in the stations. At this point, the colony is considered to be reduced or eliminated. Monitoring continues in case termites return.

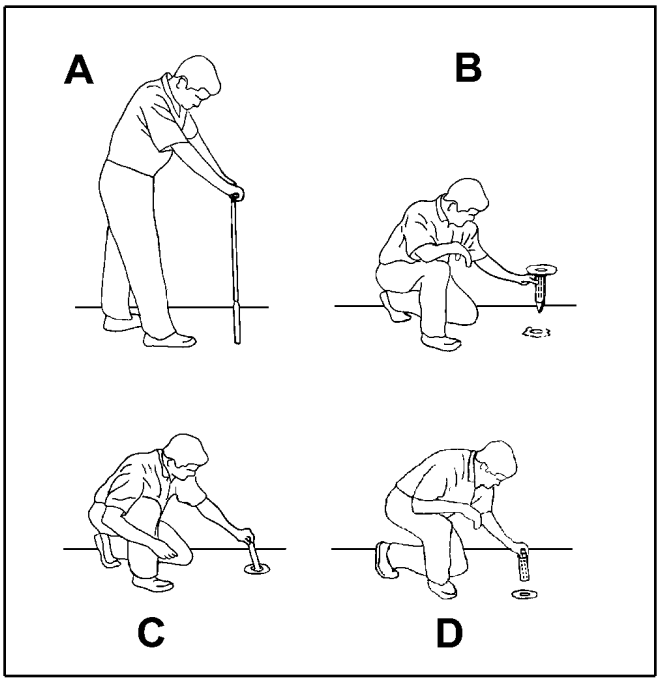

Figure 5. General procedure for baiting: A.) holes made for the stations B.) stations are installed C.) stations checked periodically for termites D.) bait added when termites appear and as needed until termites disappear from all stations.

Advantages/Disadvantages of Baits

Baits have many advantages over liquid termiticides. However, they have some limitations. Here are some points to consider when trying to decide between using baits or termiticides:

Advantages

- very small amount of AI per treatment (less than an ounce)
- baits are inside bait station, hard for children or pets to get to them
- AI does not get into soil or water
- no odor
- no large holes drilled through walls or floors

- no chemicals left in soil after treatment is finished
- colony is completely eliminated in many cases

Disadvantages

- several weeks to several months needed to take effect, sometimes more than a year
- works only if termites find and eat the bait
- no chemical residues left after treatment to protect from further infestations
- can be more expensive than liquid termiticides

What Bait Products Are Available Now?

Currently there are six different subterranean termite bait systems available for commercial use. Several others are in development and should be on the market within the next few years. Below are brief descriptions of the baits now being used:

Sentricon®

This was the first termite bait available for commercial use. It is marketed by Dow AgroSciences as the Sentricon® Colony Elimination System. Stations containing wood or wood-like monitoring pieces are installed in the ground. When termites appear, the pieces are replaced with Recruit™ bait. For infestations in structures, above-ground stations baited with Recruit AG™ are used. The active ingredient in Sentricon® is hexaflumuron.

Sentricon® is the only bait product labeled for stand-alone pre-treatment of structures. This means it can be used as a preventive (pre-construction) treatment without using a liquid termiticide.

Outpost™

Bayer features the Outpost™ Termite Detection System and Outpost Termite Bait Response. These are part of Bayer's Home Health™ program which combines liquid, dust, foam, and gel termiticides with baiting for treating subterranean termite infestations. The bait is a powder (made of alpha-cellulose) containing diflubenzuron as the AI.

Exterra™

The Exterra Termite Interception and Baiting System is made by Ensystex. The active ingredient in their Labyrinth™ bait is diflubenzuron.

One big difference between the design of Exterra's Quarterra bait station and its competitors is the Quarterra station holds wood monitoring pieces and bait at the same time. The wood fits into slots in the inside wall of the station leaving the center of the station empty. When termites appear, the shredded paper-like bait is placed in this open space. The wood is left in place so the termites can continue feeding without interruption. This is a useful feature because sometimes termites will abandon a station if they are disturbed. Because of this design, the Exterra station has a larger diameter (about four inches) than competing brands (two to two-and-a-half inches). Above-ground stations are also available for direct application to termite-infested areas in or on a structure.

Exterra also makes bait bags. These are used in hard to reach areas or places where plastic stations will not fit.

FirstLine®

Baiting is one part of FMC's FirstLine® Termite Defense System. For infestations in or on a structure, a localized treatment with liquid termiticide or above-ground FirstLine® Termite Bait stations is used. Around the structure, SMARTDISC™ Locators and monitoring stations are placed in the ground to detect termites. If they are found, the monitoring station is replaced with a FirstLine® GT Plus Termite Bait station. The bait is corrugated cardboard that contains sulfluramid as the active ingredient. FMC also makes the Defender™ unit. This is a large bait station (about six inches in diameter) that can hold any combination of four wood monitor pieces and bait tubes.

Terminate™

This is a bait product made by Spectracide that homeowners install and monitor themselves. The other five termite bait products can only be applied by licensed pest control operators. The Terminate™ bait

stations are smaller than professional brands and lack a disk top. The AI is sulfluramid.

Spectracide does not guarantee termite control when Terminate is used by itself. According to the label, a liquid termiticide must be used with the bait for complete control.

Buying and using do-it-yourself termite bait products generally **IS NOT RECOMMENDED**. Effective termite baiting requires training, experience, and an understanding of termite biology and behavior.

Subterfuge®

This product is manufactured by BASF Corporation. One difference between the Subterfuge® bait system and the others is no wood or cardboard monitor is used. Baits are added when stations are first placed in the ground. This way, termites can begin feeding on the AI as soon as they find the bait. BASF does not make an in-ground station but any approved commercially-available station that the bait cartridge will fit in can be used. The bait is a dry material that looks like fine, shredded sawdust. The AI is hydramethylnon.

Is Baiting More or Less Expensive than Using Termiticides?

Generally, termite baiting is more expensive. The price of a bait treatment includes an installation fee, sometimes the cost of the bait and stations, plus the service of having the pest management professional (PMP) perform routine inspection of the bait stations both during and after baiting. A liquid termiticide treatment generally costs less because it usually is done in a single visit.

So What's Better, Baits or Liquid Termiticides?

This is the most common question asked by homeowners. Unfortunately, there isn't a simple answer. Baiting and liquid termiticides both have certain advantages and disadvantages. One may be more practical than the other in some situations (for example, liquid termiticides are necessary when immediate control is needed for real estate transactions). Two big factors to consider when choosing between the two are cost and time. Baiting can be more expensive and take longer for control, but it is closely watched by the pest management company. Baits also may eliminate the colony. Personal feelings toward insecticides may also be a factor. Baits would be ideal for those who do not want liquid pesticides used around their home (see the last section of EDIS publication ENY-210 "Subterranean Termites" http://edis.ifas.ufl.edu/IG097 for additional information on whether to use baits).

Table 1. Subterranean Termite Baiting Systems Now Available

Product	Company	Active Ingredient	How It Kills Termites	Use	Above-ground Stations	Can Be Used Without Liquid Termiticide
Exterra	Ensystex	Diflubenzuron	Prevents formation of cuticle	Professional	Yes	Yes
First Line®	FMC®	Sulfluramid	Stomach Poison	Professional	Yes	Yes
Outpost™	Bayer	Diflubenzuron	Prevents formation of cuticle	Professional	No	Yes*
Sentricon®	Dow AgroSciences	Hexaflumuron	Prevents formation of cuticle	Professional	Yes	Yes
Subterfuge®	BASF	Hydramethylnon	Stomach Poison	Professional	No	Yes
Terminate™	Spectracide	Sulfluramid	Stomach Poison	Homeowner	No	No

* Bayer recommends using Outpost with their other termite control products.