

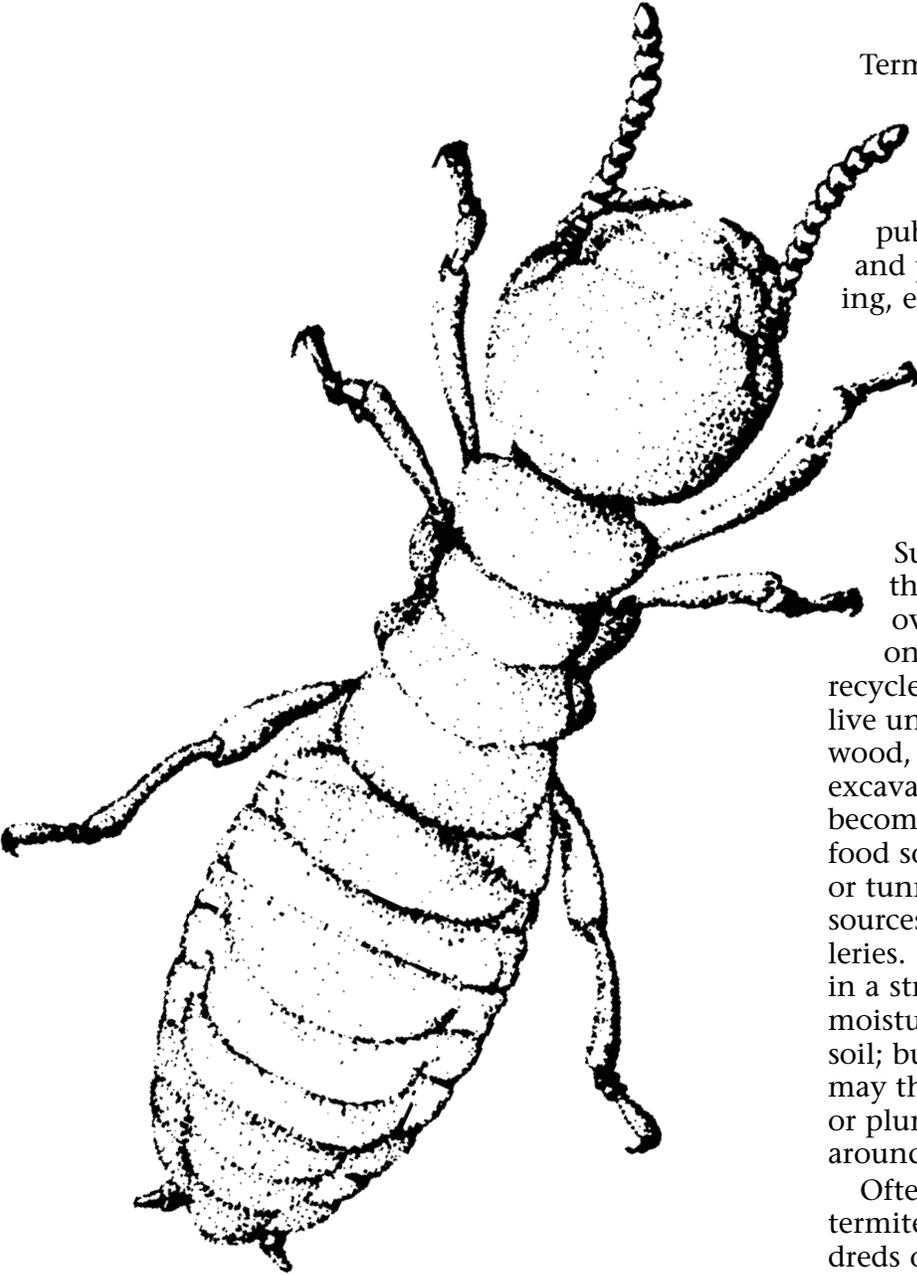
Homeowners' Guide to Termite Baits

Termite baits are one of a variety of tools that can be used separately or in concert to control one of the most covert and challenging invaders of homes, subterranean termites. This publication describes the principles and products involved in termite baiting, enabling homeowners to make better-informed decisions about using this approach and technology.

Overview of the Biology of Subterranean Termites

Subterranean termites are small insects that live in colonies of thousands to over a million individuals. They are one of nature's key decomposers and recyclers of wood. These termites typically live underground or in stumps, logs, firewood, roots, or wood in a building. They excavate thin channels through soil, which become their subterranean highways to food sources. They also build "mud tubes" or tunnels to connect aboveground wood sources to their network of underground galleries. Subterranean termites eating wood in a structure usually remain dependent on moisture retrieved during trips back to the soil; but even if isolated aboveground, they may thrive if water is available from a roof or plumbing leak, or from condensation around an air conditioner.

Often the first evidence of a long-standing termite infestation is the appearance of hundreds or even many thousands of winged reproductives (called alates or swarmers) inside the home. These dark-colored termites with four wings are the future kings



and queens produced by an existing colony to fly and found new colonies. They are harbingers of an already well-established colony somewhere in the neighborhood.

A single subterranean termite colony often exploits more than one food source at the same time, with clusters of activity occurring in locations as dispersed as 80 yards apart—nearly the length of a football field! Thus a colony may be centered in a neighbor's yard or across the street, but your house may also be on the colony's menu.

Because of the cryptic habits of these pests, termite infestations may go undetected for years, even hiding from experienced inspectors. Active termites can remain concealed behind walls and in inaccessible portions of a building, eventually causing structural damage. Subterranean termites are thus a formidable challenge to detect and control, and perseverance may be required in designing, executing, and monitoring any treatment program.

The Classic Treatment: Creating a Chemical Barrier

To best understand termite bait technology it is helpful to keep in perspective the traditional approach to subterranean termite control. For decades the conventional method of treatment has been to drench a liquid pesticide (termiticide) into the soil surrounding an infested building. Several hundred gallons of the termiticide solution may be injected into the soil around the perimeter of the house, through holes drilled in concrete slabs, and into walls of the foundation. The goal of this type of application is to create a continuous chemical barrier surrounding and beneath the structure in order to block access of termites through soil adjacent to the foundation of the house. These termiticides act to either kill or repel termites that attempt to pass through the barrier.

In practice, it is extremely difficult to apply a complete and continuous chemical barrier. Rocks or roots below the soil surface, irregularities in soil density, and inaccessibility of some areas make it hard to achieve a uniformly thorough coverage. Termites can travel through very thin tunnels and cracks,

so they may eventually find an unprotected route of entry back into the home. Furthermore, liquid termiticides injected around a structure limit only a portion of the termite colony's foraging range. The termites may be dissuaded from traveling to the house, but they may remain active for many years in the yard or in the neighbor's wood lot. Over time, the chemical barrier around a home degrades or may be disrupted by construction (building an addition or deck, for example) or landscaping. Termites exploring the area may then find a soil gap in which the residual termiticide is no longer effective, and they may reenter the house.

Termite Baits: A Different and Innovative Approach

Termite baiting is based on a totally different concept than a traditional soil drench treatment. Instead of applying a chemical barrier designed to exclude the voracious pests from a food source, termites are actually offered food sources, called baits. Treatment baits have two components: a matrix containing cellulose (the main constituent of wood and staple of a termite's diet) and a slow-acting termiticide. Termites feeding on the bait are not killed immediately, so they have time to recruit nestmates to the bait and to pass the pesticide to other colony members through food transfer behaviors that are characteristic of social insect colonies. Like a long-term intravenous port delivering drugs to a patient, baits act as an artery for delivery of pesticides into the "heart" of a termite colony, ultimately leading to decline or perhaps elimination of the colony. Thus, the goal of termite baiting is suppression of the pest population, not just exclusion, which is the primary objective of barrier treatments. If successful, a termite baiting program may thereby reduce the risk of a reinfestation by the same colony of termites in subsequent years, although monitoring is recommended to signal activity of a new or recovered colony of termites entering the area.

Discovery of bait by termites is obviously critical to baiting success, so baits are placed where termites are likely to intercept them. Most commercially available bait systems



Image courtesy of Ensysstex Corporation.

Exterra Termite Inspection and Baiting System, with schematic illustration of termites foraging at the underground station.

involve in-ground and aboveground station options. In-ground stations are designed to interest termites as they explore the soil for new resources, encounter the bait, and establish the site as a food source for the colony. In the jargon of the bait trade, a “hit” at a station is evidence of attack of the bait matrix by termites. Aboveground bait stations are easier to place directly in the path of active termites, because they are installed in areas of known termite activity.

Termite baits are designed to precisely target subterranean termites. They are of little interest to other organisms. Baits are considered environmentally friendly because they do not affect other animals, and they use small amounts of pesticide contained within a station.

Commercially Available Termite Baiting Systems

A brief description of the four currently available termite baiting systems is given below, presented in alphabetical order.

Exterra Termite Inspection and Baiting System

Manufacturer: Ensysstex
www.ensystex.com

The in-ground Exterra bait stations are installed with thin wood panels called “interceptors” that are left in place and invite attack by passing termites. Once termites begin feeding on the wood panels, the termiticidal bait matrix (Labyrinth) is added to the station, placed in the center void sur-



FirstLine Systematic Termite Control, showing the subterranean station (right) and appearance once installed in the ground (above).



Photos courtesy of FMC Corporation.

rounded by the now infested wood blocks. Labyrinth is a paper material impregnated with diflubenzuron, a chemical that disrupts the molting process of the termites, ultimately causing their death. After initial installation, Exterra stations do not have to be lifted out of the soil to refill, a feature designed to minimize disturbance to the termites that have excavated underground tunnels to the station. Once the termiticide treatment is effective, the stations remain in place with fresh interception blocks to act as monitors if other termites enter the area. There is also an aboveground version of the Exterra bait station. In some situations the Exterra System may be the only approach used to target an infestation (as a *stand alone* treatment); in other cases this bait may be used in combination with a liquid termiticide application to one or more areas of the soil around the home.

FirstLine Systematic Termite Control

Manufacturer: FMC
www.pestsolutions.fmc.com

If termites are present, the FirstLine program uses termiticidal baits from the begin-

ning; there is no “prebaiting” step to induce termites to feed at a station before a pesti- cidal bait is introduced. If active termites are not known to be in the area, monitors are installed with baits added if the monitors become infested. The pesticide in FirstLine baits is sulfluramid, which affects the insects’ ability to produce energy. FirstLine baits come in aboveground and in-ground configurations, and are often used in conjunction with liquid termiticide treatments.

Sentricon System

Manufacturer: Dow AgroSciences
www.sentricon.com

The Sentricon in-ground baiting system involves three steps. First, stations with wood stake “monitors” are installed at regular intervals around the house to intercept termites exploring the area and encourage them to feed at the stations. Second, when a station is “hit,” the wood is removed and a bait containing hexaflumaron, a compound that interferes with insect molting, is inserted in its place. Finally, after the termiticide baiting program is completed, monitoring with wooden stakes resumes to detect termites reentering the area (and thereby warn of the need for renewed baiting). Recruit



Photo courtesy of Dow AgroSciences.

Components of the Sentricon System, including in-ground and aboveground stations.

AG is the Sentricon component for above-ground delivery of hexaflumaron bait. The aboveground system can be used only in conjunction with the Sentricon in-ground program, and is therefore not a separate treatment option. The Sentricon bait system is often recommended as a stand alone treatment, or it may be used in combination with a soil termiticide application (normally a spot treatment in the area of active infestation rather than around the entire perimeter of a home). The Sentricon System is available only through pest control professionals who have been trained and authorized to use the technology by the manufacturer, Dow AgroSciences.

Spectracide Terminate Termite Home Defense System

Manufacturer: Spectrum Corporation (United Industries Corporation)
www.dfwpest.com/terminate.htm

Terminate is a do-it-yourself termite bait, sold at hardware, garden, and home products stores such as Home Depot and Wal-Mart. Homeowners are instructed to put the bait tubes in the ground around the home, replacing them with fresh tubes if the bait is eaten. Terminate is not recommended for complete protection against termites, and the instructions state that homeowners

should get an inspection from a pest control professional. Until use patterns and efficacy of this bait are established, homeowners must be extremely cautious about relying on this bait for termite control, especially of active infestations.

Baits or Barrier?

In deciding upon a subterranean termite treatment approach for their own home, consumers are faced with options that have advantages and disadvantages. The key pros and cons of baits and chemical barrier treatments are summarized below.

Advantages of baits over barrier treatments:

- Termite baits are environmentally friendly in that very small amounts of pesticide are used in a containerized station that can be removed once treatment is finished. The pesticides do not leach into the soil, and the nature of the bait matrix makes it attractive for consumption only by termites. Some of the bait products use insect growth regulators (diflubenzuron in Exterra and hexaflumaron in Sentricon), compounds which interfere with molting, a process that does not occur in mammals, so

they have low toxicity to humans and pets.

- Because the pesticides in baits are contained and do not spread in the soil, baits can be used in sensitive situations, such as when residents have chemical sensitivities or if there is a well, cistern, stream, or pond near the structure.
- Baits have no odor (although some soil drench chemicals are also odorless).
- Baits can be used to treat homes in which structural issues such as an inaccessible crawl space or sub-slab heating ducts preclude a complete soil barrier treatment.
- Application of baits is far less invasive than applying a complete chemical barrier. Baits do not require movement of furniture and pulling back of carpets for drilling through the slab or basement floor and walls as in a barrier treatment.
- If successful, baits not only kill the termites that were invading your home, they also suppress or eliminate that termite colony. With a soil barrier treatment, much of the colony may remain thriving in your yard, poised to reinfest your home if they find a breach in the chemical barrier, or when the chemical barrier degrades.
- With baits there are no issues with future landscape or construction alterations that move soil and would therefore compromise a chemical barrier treatment.

Disadvantages of baits in comparison to chemical barrier treatments:

- Baits are a relatively new product, and scientific studies of the efficacy of bait treatments are limited. Most of the available data comes from research sponsored by the manufacturers. However, the promise of baits is well established. They work extremely well in some areas and situations, and are less satisfactory

in others. The pest control industry is still learning how to best predict where baits will be effective. It is important to note that there are also no assurances of success with the current generation of soil barrier termiticides.

- Baits do not provide residual protection. Once they are removed, no pesticide remains as a barrier to protect the home from other termites in the neighborhood.
- Baiting does not have the immediate impact of a soil barrier treatment. Because termites must find the baits and then adequate numbers of them must feed on the termiticidal matrix, and because the pesticides are designed to work slowly so that they will be spread throughout the colony, the process takes months and often years to work. Furthermore, there is a seasonal component to termite search and feeding activity, so the time of year at which the baits are installed will impact the time course of your treatment program.
- In general, bait treatments are more expensive than liquid termiticide applications. This is because bait programs require far more labor, due to multiple visits by the pest control professional to monitor and replenish the bait stations. (Also note the cost factor associated with the annual service agreement discussed below under “Additional Considerations”).

Additional Considerations

Understand and maintain the annual service agreement

No matter what approach is used in treating termites, we strongly recommend that you maintain the annual service agreement with your pest control professional. Even the most careful applications may fail. Fully understand and compare terms of the service agreement from the various pest control firms with whom you discuss your treat-

ment. In general, service contracts do not guarantee success of the treatment, nor do they insure against structural damage caused by termites. Typically, they do agree to re-treat at no additional cost if termites reappear within a specified time after the initial treatment.

After a successful bait treatment it is essential to plan for follow-up monitoring, because no residual pesticide remains around the home to protect against another wave of termites that may explore the neighborhood. Therefore, when evaluating cost comparisons between liquid termiticides and bait treatments, consider both the initial cost and the annual service contract renewal fee.

Consider a strategic plan that uses more than one tool

It is not an either/or decision between baits and barriers. The most enlightened approach to termite control is to consider each home and infestation individually, and to be prepared to mount a multi-faceted counterattack on the pests invading your house, including steps to discourage termites from living around your home. Pest control professionals often use the analogy of having a “toolbox,” meaning different techniques, technologies, and approaches for controlling a particular pest. Encourage your pest control firm to fully explain possible approaches, including combining soil termiticides and baits, if it seems appropriate. For example, if you have a known “hot spot” of termite activity in a basement window sill, you might choose to have a chemical barrier treatment in that one location to have an immediate impact on termites in that area.

At the same time, baits could be installed in hopes of eventual broad-based suppression of the termite population.

To supplement the control program, make landscape and structural modifications that will discourage termite activity around your home and work towards prevention of continued and future infestations. The main goals of these efforts are to reduce moisture and termite food sources around the house, and to eliminate points where wood that is connected to the home (even pressure-treated wood) is also in direct contact with soil. Specific recommendations include:

- check gutters and especially down spouts to make sure that water is directed well away from the house
- prune vegetation within 18 inches of the house to increase airflow and drying around the perimeter of the home
- repair roof and plumbing leaks
- make certain that there is no wood in contact with soil on deck footers or other add-ons to the home
- stack firewood well away from the house, and on cross pieces or supports that lift it off the ground (at least 12 inches off the ground will also discourage rodents).

A combination of vigilant treatment, prevention, and monitoring efforts are your best approach to successful long-term control of subterranean termites.

The information contained in this fact sheet does not imply or constitute an endorsement of any company, manufacturer, or product by Maryland Cooperative Extension.

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