



# Termite Baits: A Guide For Homeowners

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No structural pest causes more confusion than termites. Most homeowners have little knowledge of these troublesome insects and what it takes to get rid of them. Our understanding of termites has progressed considerably in recent years. New management tools including the use of baits have begun to emerge. As more termite control companies begin to offer baiting as an option, homeowners will have many questions. This publication will help homeowners make a more informed purchasing decision.

## Termites in Perspective

Subterranean termites, the variety common to Kentucky and most other states, typically live below ground in highly organized societies or “colonies” (Figure 1). Termite colonies can be enormous. A single mature subterranean termite colony may contain several hundred thousand members, occupying many nesting and foraging sites in the soil. The tiny, cream-colored worker termites can also forage considerable distances—in some cases as much as the length of a football field. Consequently, the termite colony or colonies responsible for damage may actually be located in a neighbor’s yard rather than beneath the house that is infested.

Subterranean termites excavate narrow, meandering tunnels through soil, eventually encountering wood, their primary food. Decaying tree roots, logs, stumps, woodpiles, and plant debris afford a ready and abundant supply of food for the colony. In nature, termites are very beneficial

since they help to decompose wood and recycle nutrients back to the soil. Occasionally, during their random foraging, termites encounter wood associated with buildings. Once a suitable feeding site is found, the workers establish an odor trail to attract other termites to the structure.

Subterranean termite infestations can go undetected for years, hidden behind walls, floor coverings, and other obstructions (Figure 2). Over time, significant damage can result. The small size, hidden nature, and tenacious foraging habits of these insects also pose a formidable challenge to control efforts. Unlike other repair-oriented services, such as plumbing or electrical work, termite control services battle living creatures. Even the most persistent control efforts may fail at times, reinforcing the need for alternative forms of management.



*Fig. 2. Termite damage to baseboard, discovered by the homeowner while vacuuming.*



*Fig. 1. Termites live in colonies containing specialized members. (Photograph courtesy of Tom Myers.)*

## Conventional (Barrier) Treatment

For years, the standard method of controlling subterranean termites was to apply a liquid pesticide, known as a termiticide, to the soil. The goal was to create a continuous chemical barrier around and beneath the structure to block all potential routes of termite entry. Termites attempting to penetrate through the treated soil were either killed or repelled. In actual practice, there are many obstacles to achieving such a barrier. Many potential termite entry points are hidden behind walls, floor coverings, and other obstructions. Even where access for treatment is possible, it is hard to uniformly wet soil and achieve thorough coverage. A typical barrier treatment may involve hundreds of gallons of termiticide solution injected into the ground

alongside the foundation, beneath concrete slabs, and within foundation walls. But termites can tunnel through small untreated gaps in the soil as narrow as pencil lead, so it is understandable that conventional liquid treatments sometimes fail to correct a termite problem.

Despite the large amounts of pesticides applied, barrier treatments do little to reduce termite colonies or groups of termites foraging in the vicinity of a structure. Over a period of time, termites foraging randomly in the soil may encounter either an untreated gap through which to penetrate or termiticide residues that are no longer effective. For more information on this method of treatment, see *Termite Control: Answers for the Homeowner* (ENTFACT-604).

## **An Alternative Approach: Termite Baits**

Termite baits are an entirely different concept. With this approach, small amounts of material resembling edible “smart missiles” are deployed to knock out populations of termites foraging in and around the structure (Figure 3). Some baits may even eradicate entire termite colonies. A comprehensive baiting program then seeks to maintain a termite-free condition on the customer’s property through ongoing monitoring and rebaiting as needed.



*Fig. 3. Slow-acting baits (such as the Sentricon Colony Elimination System pictured above) can destroy large numbers of termites foraging in the vicinity of a structure. (Illustration courtesy of DowElanco).*

Termite baits consist of paper, cardboard, or other “termite-friendly” food, combined with a slow-acting substance lethal to termites. The bait must be palatable enough that termites will readily consume it, even in the presence of competing tree roots, stumps, woodpiles, and structural wood. If the bait kills too quickly, sick or dead termites may accumulate in the vicinity of the bait stations, increasing the chance that other termites will avoid the area. Delayed-bait action also enhances transmission of the le-

thal agent to other termites, including those that never fed on the bait. Theoretically, entire colonies could be eliminated in this manner, although total colony elimination may not be necessary to protect a structure.

## **Pattern of Use**

Professional pest control firms now employ various methods of termite baiting. Some bait products are inserted below ground out in the yard, whereas others are installed above ground level on the inside of the structure. On some properties, baits may constitute the only form of treatment; on others, they may be supplemented with either a partial or complete liquid (barrier) application.

## **Installation Below Ground**

Baits are deployed below ground by enticing termites to feed on wooden stakes, cardboard, or some other cellulose-based material. The toxicant-laced bait can either be installed initially or substituted after termites have been detected in an untreated monitoring device. Termites cannot see or smell the baits underground; they encounter them by chance during their random foraging activities. To increase the odds of discovery, the stations are installed at fixed intervals around the perimeter of the structure, and/or in suspected areas of termite activity (e.g., around woodpiles, stumps, moist areas, and adjacent to previous termite damage). With persistence and a little luck, the termites eventually find and feed at one or more of the bait installations.

Perhaps the greatest difficulty in belowground baiting is getting termites to find the baits in the first place. Bait discovery will vary from property to property, depending on such factors as termite foraging intensity, time of year, moisture, and food availability. On one infested property in Kentucky, more than a dozen monitoring devices were “hit” (attacked by termites) within two weeks of installation; on another home in the same neighborhood, no belowground stations were attacked during a full year of intensive monitoring, despite two concurrent termite swarms inside the home. Similar variances in bait detection have been reported elsewhere in the country.

In temperate climates such as in Kentucky, bait discovery usually is greatest during peak foraging periods in the spring and summer. Baiting during late fall and winter is generally less fruitful, although termites are occasionally found in belowground stations when air temperatures are around 30°F.

The more belowground baits installed, the better the chances of locating termites. Installing more stations increases the odds of encountering multiple colonies, or weakly associated “satellite nests” of the same colony—any of which could be a potential risk to the structure. Planning, patience, and persistence are needed for the

successful use of belowground termite baits. Regardless of the product used, the homeowner must be prepared and willing to accept the possibility of a lengthy baiting process.

### **Installation Above Ground**

Termite baits may also be installed above ground in known areas of termite activity. Typically, the stations are installed directly in the path of active termite tunnels after the mud tubes have been broken. Aboveground baiting generally produces faster results since the procedure does not depend on “chance” termite encounters with the stations.

It is too soon to know whether structural infestations can routinely be controlled with aboveground baits alone. Manufacturers currently recommend that aboveground baits be used in conjunction with other forms of treatment, such as inground baiting/monitoring or conventional barrier treatments. Nonetheless, aboveground baits provide an excellent opportunity for introducing slow-acting toxicants directly into structural termite infestations.

### **Commercial Bait Products**

Following is a description of the commercial bait products and programs being offered by a growing number of professional pest control companies. All of the products mentioned are still quite new, while others not listed are in various stages of development. Interested homeowners may need to call around to locate termite control companies using any of these products.

### **Sentricon System**

This method of termite baiting has been the most extensively tested of those currently on the market. The Sentricon™ Colony Elimination System, developed by DowElanco (Indianapolis, IN; 800/686-6200) is sold only through authorized pest control firms. The bait contains a slow-acting ingredient which disrupts the termites’ normal growth process (i.e., termites die while attempting to molt).

Termite control with the Sentricon System entails a three-step process: initial monitoring to pinpoint termite activity, delivery of the bait, and subsequent monitoring to provide ongoing protection (Figure 4).

#### **Step 1: Monitoring**

Termites are detected through plastic monitoring stations installed around the perimeter of the building. The station housing is a hollow green plastic cylinder, about 10 inches long by 2 inches wide, with slits along the sides for termites to enter. Initially, each station contains two untreated pieces of wood, intended as monitoring devices for the presence of termites in the area.

Fig. 4. Sentricon System baiting procedure.



a. Installation of the Sentricon station.



b. Removal of untreated wood monitoring device.



c. Inspection of monitoring device (note presence of termites).



d. Transferring termites to bait tube.



e. Reinsertion of bait tube into Sentricon station.

The station is inserted into an augured hole in the ground, with the cover flush with the soil surface. Monitoring stations are installed around the outside perimeter of the building's foundation at about 10- to 20-foot intervals. Narrower intervals, while requiring more effort to install and inspect, increase the odds that termites will encounter the stations during random foraging. Patios, driveways, and other paved areas are not serious problems unless they prevent soil access around the majority of the structure. Oftentimes, stations can be installed farther out from the foundation or in adjoining planter boxes.

To supplement installations along the foundation, additional stations are installed in suspected termite foraging areas, such as adjacent to pre-existing areas of termite damage, stumps, woodpiles, or moist areas on the property. Periodically thereafter (monthly, bimonthly, etc.) the wood-monitoring devices within each belowground installation are inspected for termite presence.

### Step 2: Bait Delivery

When termites are found in a monitoring device, the untreated wood pieces are replaced with a perforated plastic tube containing the bait—a white paper toweling treated with the slow-acting termite growth inhibitor (Recruit™). To hasten the overall process, termites feeding on the wood pieces are carefully dislodged and placed within the bait tube. Eventually, these termites tunnel through and out of the perforated tube, reuniting with their nestmates in the soil. In doing so, they leave behind a colony-specific odor trail that attracts other nestmates to the bait. In order to promote additional “hits,” a pair of auxiliary monitoring stations, containing wood pieces, is installed adjacent to stations receiving bait tubes.

All Sentricon stations, with and without substituted bait tubes, are inspected until no more live termites are discovered. Empty, moldy, or degraded baits are replaced, and additional auxiliary stations are added as necessary.

### Step 3: Continued Monitoring

After termites are no longer found in installed bait tubes, the tubes are once again replaced with untreated wood pieces and monitoring continues. Even if the termite colony threatening the structure has been eliminated, termites from neighboring colonies can reinfest the area. Reinfestation can also occur if only part of the original colony or colonies was eliminated. Consequently, structures protected with the Sentricon System will need to be continually monitored to guard against reinvasion from new colonies or previously suppressed ones. Depending on conditions, the pest control firm will continue to monitor at three- to four-month intervals for an indefinite period after the termite population is deemed to have been eliminated.

The Sentricon System also has a bait station (Recruit™ AG) designed for installation above ground in known ter-

mite activity areas. Bait is contained within a rigid plastic housing with openings at the base for the termites to enter. Recruit AG must be installed in areas where termites are present and accessible, such as directly over active mud foraging tubes traversing a wall stud, floor joist, or sill plate. Termites construct such tubes as they travel over foundations, floor joists, and other exposed surfaces. Placement and usage are similar to that discussed below for FirstLine™ aboveground bait.

Independent research studies, including some performed in Kentucky, indicate that the Sentricon Colony Elimination System can be an effective termite control option. A number of these studies involved structures with chronic termite infestations. Despite Sentricon's clear-cut potential, thoroughness and persistence are needed for success, as is true for any termite management program.

### **Firstline**

Another recently introduced product is the FirstLine™ Termite Bait Station, manufactured by FMC Corporation (Princeton, NJ; 1-800-321-1FMC). The product is intended for aboveground baiting of active termite tubes in a manner similar to Recruit AG. The station consists of a semi-transparent plastic housing (4 by 4 by 1 inches) with open slots at the base. It contains corrugated cardboard treated with a slow-acting ingredient lethal to termites.



*Fig. 5. Typical aboveground placement of a FirstLine Termite Bait Station.*

The station is installed at the leading edge of a previously broken, active termite tube. FirstLine stations must be installed on flat surfaces so that the base of the station meets the tube (Figure 5). The plastic housing is attached to the surface (wood, masonry, etc.) using tamper-resistant screws. When the station is installed correctly, the

termites rebuild the tube into the station and feed on the insecticide-treated cardboard. New stations may need to be substituted as baits are depleted.

It is too soon to know whether structural infestations can routinely be controlled with this product alone. The manufacturer currently recommends that FirstLine Bait Stations be used in conjunction with other forms of treatment, such as inground baiting or conventional barrier treatments. Additional research and field experience with the product are needed to determine effectiveness against structural infestations.

Another formulation of FirstLine, FirstLine GT, was recently introduced for belowground use (“GT” stands for ground treatment). FirstLine GT Termite Bait Stations consist of perforated, clear plastic tubes containing the same active ingredient and corrugated cardboard food source as the aboveground station. Additional monitoring tubes containing a piece of untreated slotted wood are installed in conjunction with the FirstLine GT baits to help monitor for the presence of termites.

Baits and monitors are inserted into the ground flush with the surface, usually in groupings of two or three tubes per target area. Label directions stress the importance of placing these in areas where termite activity is known or suspected—for example, near previous termite damage, around woodpiles and tree stumps, and in areas tending to stay consistently moist (e.g., around mulch beds, downspouts, sprinkler heads, and air conditioner units). Consequently, the FirstLine GT baits may not be installed at fixed intervals around the entire perimeter of the building, as the Sentricon baits are. Moreover, FirstLine GT baits may be installed in the soil initially, bypassing the unbaited monitoring step used with Sentricon.

As of this writing, it is too soon to predict whether structural infestations can routinely be controlled with this product alone.

### **Subterfuge System**

Another belowground termite bait that will be marketed in the near future is Subterfuge™, manufactured by American Cyanamid (Princeton, NJ). The effectiveness of this product has not yet been demonstrated under Kentucky termite conditions.

## **Baits or Barriers—Which Is Better?**

This is the most common question from homeowners trying to decide which form of treatment to purchase. The question is a difficult one, considering the industry’s limited experience with the new bait products. Liquid barrier treatments have been the standard method for controlling subterranean termites for decades. Although there have been performance failures and other problems, for the most

part, barrier treatments have afforded adequate termite protection. Although baiting clearly has potential advantages, the approach does not yet have a long-term track record on which to base its performance. Factors to consider in the purchasing decision include:

1. *Has the structure already been unsuccessfully treated using conventional methods?* Some structures have construction features that interfere with conventional soil treatment methods (e.g., wells, cisterns, subslab heating ducts, drainage systems, inaccessible crawl spaces, stone foundations, etc). Buildings with hard-to-treat construction or chronic re-treatment histories are logical candidates for termite baits. With bait treatments, access is seldom a problem since foraging termites are as likely to encounter belowground bait stations around the foundation exterior as beneath the structure. In respect to contamination of wells, heat ducts, drainage systems, etc., baits are of negligible risk and can be used in the most sensitive treatment situations.

2. *Are you opposed to having your floors drilled and your furniture, stored items, or carpeting moved?* Baiting requires fewer disruptions than conventional barrier treatment. The technician may not even need to come indoors to install or monitor the bait stations. Noise, drill dust, and similar disruptions associated with conventional treatment are avoided.

3. *Are you strongly opposed to the use of pesticides around your home?* Based on the current body of scientific research, conventional liquid termiticides pose no significant hazard to humans, pets, or the environment when applied according to label directions. Although the health risk from such treatments is negligible, some individuals are still apprehensive. Homeowners concerned about the use of pesticides may find the concept of baiting more attractive. With baits, the total amount of material applied is minute compared to the high amounts needed to achieve a thorough and effective soil-barrier treatment.

4. *How much are you willing to spend for termite protection?* Termite treatments are rather expensive, ranging in price from about \$500 to \$2,000. Along with the initial treatment fee, homeowners are advised to purchase a renewable service agreement (warranty) in case the termites return. Depending on the circumstances, a baiting program may end up costing more than a conventional treatment because baiting programs require multiple visits to monitor the bait stations. This is especially true with respect to purchase of the renewable service agreement. Whereas conventional treatments typically entail a single annual followup inspection, baiting contracts may require three or more visits per year for as long as the agreement

is in effect. Thus, the annual renewal fee for baiting typically may be two to three times higher than the cost for conventional treatment. Homeowners should consider both the initial treatment price and renewal fee in making their purchasing decision.

5. *Assuming your home will be baited, should you also request a supplemental liquid barrier treatment?* The need for supplemental soil treatment depends on the circumstances. Property owners with a serious termite problem or those involved in a real estate transaction may not want to wait several months for baits to suppress or eliminate the infestation. With comprehensive baiting programs such as Sentricon, liquid applications (when deemed necessary) are usually made as partial treatments to infested areas rather than to the entire structure. Other bait products (e.g., FirstLine) may be more suited for spot-treatment of active tunnels, feeding galleries, and localized areas in the soil. Such products are typically used in conjunction with more extensive barrier treatments.

## Further Considerations

The “art” and “science” of termite baiting is in an evolutionary state. Many questions are still without answers. One certainty is that the products will not perform by simply hammering a few baits into the ground and walking away. Success will require thoughtful installation and diligent monitoring by an experienced service technician, backed by a responsible pest control firm (Figure 6).



*Fig 6. Continuous monitoring is essential to the success of any termite baiting program.*

### **Photographs used with permission.**

*Where trade names are used, no endorsement is intended, nor criticism implied of similar products not named. For further information about the termite bait products mentioned in this publication, contact the manufacturer (see above for telephone numbers), your local termite control professional, a state regulatory agency responsible for termiticide usage, or the Cooperative Extension office in your area.*