



### SUBTERRANEAN TERMITE CONTROL PRODUCTS

A survey conducted by the Alabama Cooperative Extension System in early 2004 shows that 75 percent of the Alabama pest control companies consider termite control the most difficult and the highest cost service. About 65 percent rank termite service as being the most profitable, and 90 percent rate it as being the most risky and the greatest liability.

Termite control of homes requires special skills, specialized equipment, and knowledge about both termite biology and building construction. Therefore, termite treatment is better left for certified pest control professionals. A possible exception would be if a mailbox post, sandbox, or other small wooden object not attached to the house was infested.

There are more termite-treatment options available today than ever before. In general, there are five types of treatment programs: liquid termiticides, bait systems, wood preservatives, mechanical barriers, and biological termiticides. The success of these programs depends on professional workmanship.

Although none of the products contain restricted pesticides, most of the products are for professional use. "Do-it-yourself" products, sold to homeowners at retail stores or bought over the Internet, will seldom eradicate an existing termite problem.

This publication attempts to explain the pros and cons of each type of treatment program and is a supplement to Extension publication ANR-1022, "IPM Tactics for Subterranean Termite Control."

#### Liquid Termiticides

There are two groups of liquid termiticides: new non-repellent termiticides and repellent termiticides. See Tables 1 and 7 for more information.

**Application.** Liquid termiticides can be used for pre- and post-construction treatments to create a chemical barrier in the ground around your house and potential entry points. The chemical barrier either kills or turns termites away.

**Termiticide users are required by LAW to comply with the instructions and directions for use in product labeling.**

#### Advantages:

- Provide immediate protection for the structure
- Require less maintenance
- Repellent termiticides are the most inexpensive treatment.
- Non-repellent termiticides are not detectable by termites, so termites tunnel in and are killed.

#### Disadvantages:

- Require drilling/injection of slabs and other masonry components and trenching/drenching of soil
- Require equipment for mixing, drilling, and injecting

- Are not recommended for application within 50 feet of a body of water, well or cistern
- Repellent termiticides may have an odor associated with their use.
- Gaps in repellent termiticide applications may later provide access to termites.

#### Bait Systems

See Tables 2 and 7 for more information.

**Application.** Maintaining bait systems is an on-going process involving monitoring, baiting, and inspection. It begins with plastic stations, which are placed in the ground around the structure (10 to 20 feet apart). Inside the stations are either monitoring food sources or baits. These stations are inspected monthly or quarterly, and when termites are found inside a station, the monitoring food source is replaced with bait. Baited stations can also be installed aboveground in the path of termite tunnels or over termite-infested wood. Termites consume the bait and communicate the source of the bait to colony members, thus killing the termite colony. Baits contain either an insect growth regulator or a slow-acting toxicant. Bait systems are recommended for postconstruction treatment only.

#### Advantages:

- Are environmentally friendly and extremely low toxicity to humans and pets
- Can be used in situations where the infested structure is within 50 feet of a well or 100 feet of a body of water
- Are less intrusive: no drilling/trenching is required and installation is easy.

#### Disadvantages:

- With no means of attracting termites into the monitors, bait systems may take longer than other treatments to control termites.
- Are expensive due to the continuous process of monitoring, with baits applied as necessary
- Require high maintenance
- In some cases, complementary liquid treatment may be needed.

#### Wood Preservatives

See Tables 3 and 7 for more information.

**Application.** Liquid wood preservatives are applied on unfinished wood to prevent or kill termites and should be used as supplemental application in conjunction with liquid termiticides or baits. In addition to the chemicals listed here, some non-repellent termiticides are also labeled for wood treatment.

**Advantages:**

- Are low in mammalian toxicity
- Are less expensive
- Can last for decades unless exposed to constant rewetting

**Disadvantages:**

- Cannot be used on weather-exposed outdoor wood due to leaching problem
- May not penetrate to the center of the wood beam

**Biological Termiticides**

See Tables 4 and 7 for more information.

**Application.** Biological termiticides are formulated either as wettable powder (fungus) or in a water dispersible medium (nematodes) and can be used for spray or injection in the same way as liquid termiticide. Dosage is 100 ppm per gallon of water per linear foot of treated area.

**Advantages:**

- Are safe for people, plants, and non-targeted organisms

**Disadvantages:**

- Have to be applied when temperature is between 50 and 80°F
- The solution must be agitated during application.

**Termite-Proof Materials**

See Table 5 for more information.

**Application.** Two types of termite-proof durable material are available. One is pesticide free and made of durable materials that work as mechanical barrier. The other contains a termiticide between durable polymer layers and kills upon being contacted or chewed on. Termite-proof material is installed prior to pouring the concrete slab and positioned around utility conduits (plumbing, electrical pipes and wires, and bath trap areas).

**Advantages:**

- Are environmentally responsible, user friendly
- Provide protection even before occupancy
- Are durable

**Disadvantages:**

- Can be put in place pre-construction only
- Should be used to complement liquid or bait treatments

**Table 1. Liquid Termiticides**

Active Ingredient	Trade Name	Registrant	Use
<b>New Nonrepellent Termiticides</b>			
chlorfenapyr	PHANTOM®	BASF	Stand-alone
fipronil	TERMIDOR 80WG	BASF	Stand-alone
	TERMIDOR SC	BASF	Stand-alone
	TERMIDOR NY	BASF	Stand-alone
imidacloprid	PROMISE 75WP	Bayer	Stand-alone
	PROMISE GEL	Bayer	Supplemental (Ready-to-use)
indoxacarb	APERION	Dupont	Stand-alone
<b>Repellent Termiticides</b>			
beta-cypermethrin	CYPER TC	Control Solutions, Inc.	Stand-alone
	DEMON TC	Syngenta	Stand-alone
	DEMON WP	Syngenta	Stand-alone
	PREVAIL FT	FMC Corporation	Stand-alone
bifenthrin	BIFENTHRIN PRO	BASF	Stand-alone
	TALSTARTONE MULTI-INSECTICIDE	FMC Corporation	Stand-alone
	BIFLEX TC TERMITICIDE/ INSECTICIDE	FMC Corporation	Stand-alone
chloronhaniliporle	ATMISSET	Dupont	Stand-alone
cyfluthrin	TEMPO TC		Stand-alone
	BAYER PRO DUST	Bayer	Stand-alone
deltamethrin	SUSPEND SC	AgroEvo Environmental Health	Ready-to-use
	CB D-FORCE™ HPX RESIDUAL WITH DELTAMETHRIN	FMC Corporation	Ready-to-use
fenvalerate	TRIBUTE	AgroEvo Environmental Health	Stand-alone

Active Ingredient	Trade Name	Registrant	Use
<b>Repellent Termiticides (cont.)</b>			
permethrin	DRAGNET FT	FMC Corporation	Stand-alone
	DRAGNET SFR	FMC Corporation	Stand-alone
	MARTIN'S PERMETHRIN SFR	Control Solution, Inc.	Stand-alone
	MASTERLINE TERMITICIDE T/C	Univar	Stand-alone
	PERMETHRIN PRO	BASF	Stand-alone
	PERMASTER 380 PERMETHRIN	LG Chemical America, Inc.	Stand-alone
	PERMACAP CS	BASF	Stand-alone
	PERMETHRIN TC	Speckoz, Inc.	Stand-alone
	PRELUDE	Syngenta	Stand-alone
	TENGARD SFR ONE SHOT	United Phosphorus	Stand-alone
	38 PLUS TURF, TERMITE, AND ORNAMENTAL	Hi-Yield.com	For home owner use
tralomethrin	SAGA WP	Bayer	Stand-alone

**Table 2. Bait Systems**

Active Ingredient	Trade Name	Registrant	Characteristics	Use
diflubenzuron	ADVANCE™	Whitmire MicroGen Research Laboratories, Inc.	Insect growth regulator	In-ground monitor-bait stations
	EXTERRA® TERMITE INTERCEPTION AND BAITING SYSTEM	Ensystem, Inc.	Insect growth regulator	In-ground monitor-bait and above-ground bait stations
fipronil	TERMICON®	Pestube System, Inc.	Slow-acting stomach poison	In-ground bait stations
hexaflumeron	SENTRICON®	Dow AgroSciences	Insect growth regulator	In-ground monitor-bait and above-ground bait stations
noviflumuron	SENTRICON® IG	Dow AgroSciences	Insect growth regulator	In-ground monitor-bait and above-ground bait stations
hydramethylnon	SUBTERFUGE TERMITE BAIT®	BASF	Slow-acting stomach poison	In-ground bait stations
sulfluramid	FIRSTLINE®	FMC Corporation	Slow-acting stomach poison	In-ground monitor-bait and above-ground bait stations
	SPECTRACIDE TERMINATE™ HOME CHOICE	United Industires Corporation	Slow-acting stomach poison	Marketed for homeowners, supplemental use. Does not use monitor
disodium octaborate tetrahydrate	TERMITROL BAIT SYSTEM WITH TERMIRID 613	Professional Pest Control Products, Inc.	Slow-acting stomach poison	Marketed for homeowners, supplemental use.

**Table 3. Wood Preservatives**

Active Ingredient	Trade Name	Registrant	Characteristics /Use
amine copper quat (ACQ-A,B,C)	ACQ PRESERVE	Chemical Specialties, Inc. (SCI)	EPS's general use pesticides. Not leachable. The preservative effects of copper are combined with a low toxicity co-biocide to achieve durability levels equivalent to copper/arsenic preservative with no impact on the mechanical properties of wood. Water resistant.
amine copper quat (ACQ-D)		Osiose, Inc.	This product contains active ingredients similar to ACQ-A,B,C, but uses ethanolamine instead of ammonia as the solution carrier. Water resistant.
borate oxide	ADVANCEGUARD		
copper 8-quinolinolate	WOOD GUARD OIL-BASED WOOD PRESERVATIVE	ISK Biocides, Inc.	This preservative contains copper. Water repellent. Supplemental use
copper azole-type A (CBA-A)	WOLMANIZED NATURAL SELECT	Arch Wood Protection	This new generation preservative contains copper and boron. Water resistant. Intended for ground contact. Similar durability as conventional CCA
copper naphthenate	COPPER-GREEN'S WOOD PRESERVATIVE	Green Products, Co.	This preservative contains copper. Moisture and weather resistant. Supplemental use
disodium octaborate tetrahydrate	ARMOR-GUARD	NovaGuard Technologies, Inc.	Powder Supplemental use
	ARMOURTEK	Armourtek, Inc.	Various formulation Uses Armourtek's Toughwood treatment to permanently lock treatment into wood
	BORA-CARE	Nisus	Liquid Supplemental use. Penetrates deeper and lasts longer than Tim-bor
	JECTA GEL	Nisus	Ready-to-use Supplemental use
	PENETREAT	Sashco, Inc.	Liquid Supplemental use
	SHELL-GUARD	NovaGuard Technologies, Inc.	Liquid Supplemental use. Penetrates deeper, lasts longer than Armor-Guard
	TIM-BOR	U.S Borax	Powder Supplemental use
monoethanolamine copper naphthenate	WOODLIFE COPPER COAT	Wolman	This preservative contains copper. Water repellent and moisture resistant. Supplemental use
	WOODLIFE CREOCOAT	Wolman	This preservative contains copper. Water repellent. Supplemental use
zinc naphthenate	GREEN'S CLEAR WOOD PRESERVATIVE	Green Products, Co.	This preservative contains zinc. Water repellent. Supplemental use

**Table 4. Biological Termiticides**

Organisms	Trade Name	Registrant	Use
fungus: <i>Metarhizium anisopliae</i> , var. Anisoplias strain ESF1	BIO-BLAST BIOLOGICAL TERMITICIDE	Ecoscience Corporation	Spray onto termite infestation
nematode: <i>Heterorhabditis bactergeriophora</i>	NA	Arizona Biological Control, Inc.	In a water-dispersible medium. Store in 38 to 30°F environment until being used.
nematode: <i>Steinernema carpocapses</i>	NA	Arizona Biological Control, Inc.	In a water-dispersible medium. Store in 38 to 30°F environment until being used.

**Table 5. Termite-Proof Materials**

Active Ingredient	Trade Name	Registrant	Characteristics	Use
aluminum	ALTERM	Alterm Pty. Ltd.	Solid 0.5 mm marine grade aluminum	Fix to potential termite entry areas.
basaltic rock	GRANITGARD®	GranitGard Pty Ltd.	Graded stone particles (roughly 16 grit) which are too large and heavy for termites to shift, too hard to dissolve, and too closely packed to penetrate	Lay beneath the concrete floors of new buildigs or around foundation footers.
disodium octaborate tetrahydrate	TERM-A-RID 613	Termarid, LLC	Treated wood stakes or mulch	Ready-to-Use
lambda-cyhalothrin	IMPASSE	Syngenta Crop Science	A termiticide locked in between outer polymer layers	Install around plumbing, electrical, and other utility penetrations
stainless steel	TERMI-MESH®	Termi-Mest Australia Pty Ltd.	A stainless steel mesh (aperture of 0.66 x 0.45 mm)	Wrap around foundations, pipes, posts

**Table 6. Restricted Use Fumigants for Controlling Subterranean Termites<sup>1</sup>**

Active Ingredient	Trade Name	Percentage	Manufacturer
2-2-dichlorovinyl dimethyl phosphare	CARD-O-VAP 8	7.8	Cardinal Professional Products
chloropicrin	CARDINAL CHLOROPICRIN 100	99	Cardinal Professional Products
	CARDINAL CHLOROPICRIN WARNING AGENT	99	Cardinal Professional Products
methyl bromide	BROM-O-GAS	98	Great Lakes Chemical Corp.
	TERR-O-GAS	67	Great Lakes Chemical Corp.
	METH-O-GAS Q	99.5	Great Lakes Chemical Corp.
	METH-O-GAS 100	99.5	Great Lakes Chemical Corp.
	CARDINAL METHYL BROMIDE	100	Cardinal Professional Products

Active Ingredient	Trade Name	Percentage	Manufacturer
methyl bromide (cont.)			
	CARDINAL METHYL BROMIDE Q	100	Cardinal Professional Products
	CARDINAL METHYL BROMIDE 98-2	98	Cardinal Professional Products
	CARDINAL PIC-BROMIDE 25	75	Cardinal Professional Products
pyrethrins, piperonyl butoxide, and n-octyl bichloheptene dicarboximide	PCO FOGGER WITH ESFENVALERATE	0.05,0.10,0.167	FMC Corporation
	PCO FOGGER WITH PYRETHRINS	0.5,1.0,1.0	FMC Corporation
sulfuryl fluoride	PROFUME	99.8	Dow AgroSciences
	VIKING GAS FUMIGANT		Dow AgroSciences

<sup>1</sup> All fumigants listed here are **RESTRICTED USE PESTICIDES**.

**Table 7. Website for Termite Control Products**

Type of Program/ Product	Website Address
<b>liquid termiticide (nonrepellant)</b>	
PREMISE	<a href="http://www.bayerprocentral.com/products/premise/index.html">www.bayerprocentral.com/products/premise/index.html</a>
TERMIDOR	<a href="http://www.es.aventis.com/pest/termite/termprodinfo.asp">www.es.aventis.com/pest/termite/termprodinfo.asp</a>
<b>liquid termiticide (repellant)</b>	
DEMON and PRELUDE	<a href="http://www.syngentaprofessionalproducts.com/Prod/">www.syngentaprofessionalproducts.com/Prod/</a>
<b>baiting systems</b>	<a href="http://www.doityourselftermitecontrol.com/termatrol.htm">www.doityourselftermitecontrol.com/termatrol.htm</a> <a href="http://www.ensystex.com">www.ensystex.com</a> <a href="http://www.fcm-apgspec.com/pstc.htm">www.fcm-apgspec.com/pstc.htm</a> <a href="http://www.sentricon.com/">www.sentricon.com/</a>
<b>wood preservatives</b>	
BORATE-BASED PRODUCTS	<a href="http://www.nisuscorp.com">www.nisuscorp.com</a> <a href="http://www.novaguard.com">www.novaguard.com</a>
<b>biological termiticides</b>	
BIO-BLAST	<a href="http://www.ecosci.com/bioblast/msdsblast.htm">www.ecosci.com/bioblast/msdsblast.htm</a>
<b>fumigants</b>	
SYNTHETIC PYRETHROID PRODUCTS	<a href="http://www.fmc.com.en_US/frameptest.cfm?Graphic=chemicals&amp;ID=www.fcm-apgspec.com">www.fmc.com.en_US/frameptest.cfm?Graphic=chemicals&amp;ID=www.fcm-apgspec.com</a>
OTHER FUMIGANTS	<a href="http://www.dowagroscience.com">www.dowagroscience.com</a>
<b>other termiticides</b>	
DURSBAN <sup>1</sup>	<a href="http://www.dowagro.com">www.dowagro.com</a>

<sup>1</sup> Under pressure from EPA, Dow Chemical pulled Dursban from retail shelves at the end of 2001, but continues selling it for termite pretreatments in new home construction. Until its use as a termiticide is banned in 2006 for new homes and buildings, it is still being used.

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**For more information**, contact your county Extension office. Visit <http://www.aces.edu/counties> or look in your telephone directory under your county's name to find contact information.

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Use pesticides **only** according to the directions on the label. Follow all directions, precautions, and restrictions that are listed. Do not use pesticides on plants that are not listed on the label.

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The pesticide rates in this publication are recommended **only** if they are registered with the Environmental Protection Agency or the Alabama Department of Agriculture and Industries. If a registration is changed or canceled, the rate listed here is no longer recommended. Before you apply **any** pesticide, check with your county Extension agent for the latest information.

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Trade names are used **only** to give specific information. The Alabama Cooperative Extension System does not endorse or guarantee any product and does not recommend one product instead of another that might be similar.

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