

The Economics of Termite Pretreatments and Service Contracts

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The termite industry's primary economic model is based on termite soil treatments and a lucrative perpetual service contract revenue stream. In the last few years, a new twist has been added with bating stations because bating stations fit nicely into the current model and can even help the long term profitability. The large players in the termite industry will do whatever is needed to protect their lucrative revenue streams. Other technologies such as borates and sodium silicate threaten the lucrative service contract revenue stream because they eliminate the need for ongoing termite treatments. Unfortunately, what is good for consumers is very bad for the termite industry so the large players want to make sure these new technologies are not adopted.

In this paper we will take a detailed look at the termite industry - the largest single part of the Arizona pest control industry. Termite control is often bundled with other wood destroying insects so when we talk about termites, we also include other wood destroying insects.

The rules

To understand the economics of the termite pest control industry, you must start by understanding how the termite pest control industry works in Arizona and the laws and rules that govern the termite pest control industry. A good place to start is with the laws and rules that govern the industry. Don't worry about some of the terminology in the rules as it will be explained later in the text.

Rule R4-29-305 (Performing Wood-destroying Insect Control), subsection D (Pretreatment for commercial or residential construction) covers the case where the structure itself is being treated during the structure's construction. R4-29-305.D specifies the minimum termite pretreatment to be a horizontal under-slab termiticide soil treatment followed by a vertical termiticide treatment of all accessible soil in the immediate vicinity of any part of the structure that extends to the ground.

Rule R4-29-305 (Performing Wood-destroying Insect Control), subsection E (New construction treatment for commercial or residential construction) covers the case where the structure itself has been otherwise treated. R4-29-305.E specifies the minimum termite pretreatment to be a vertical termiticide treatment of all

accessible soil in the immediate vicinity of any part of the structure that extends to the ground.

Soil barriers

Let's move on to how termite control is normally done in Arizona. In Arizona, termite protection is required to include a soil treatment. The purpose of the soil treatment is to set up a barrier in the ground that will protect the house from termites. A soil barrier can provide protection by killing the termites (a contact termiticide) or by repelling the termites (a repellent termiticide). Or a soil barrier can provide a combination of the two.

Soil barriers are created underneath the building slab as well as around the exterior of the foundation. The soil barrier underneath the building slab is often referred to as the horizontal barrier while the soil barrier around the foundation is often referred to as the vertical barrier, final grade or wrap-around treatment.

To create the horizontal barrier underneath the building slab, you are required to saturate the soil with a termiticide. The rate of application is 1 gallon for every 10 square feet, which is equivalent to 0.1 gallon per square foot. So a 2000 square foot building requires a minimum of 200 gallons of termiticide under the slab. Some areas, such as around plumbing, corners, slab joints, interior side of the foundation wall and step-down areas are called critical areas and require a higher level of treatment - i.e., more termiticide per square foot.

The horizontal soil treatment must be done just prior to pouring the slab - typically only hours before, but generally no more than 24 hours before pouring the slab. Any disturbance of the soil from digging, water flow or even walking can damage the barrier. The applicator must be very careful to apply the pesticide evenly across the under-slab soil as any thin spots will weaken the barrier.

After the slab has been poured and the exterior grading has been finished, an additional vertical soil barrier is provided along the exterior foundation wall - often called the final grade or wrap-around treatment. The vertical soil barrier requires roughly 4 gallons per 10 linear feet per foot of depth, which is equivalent to 0.4 gal per linear foot of depth. The "per foot of depth" is the depth of the footer below final grade. For instance, if the bottom of the footer is 2 feet below grade, the final grade treatment would require roughly 8 gallons per 10 linear feet. So a 2000 square foot building with an exterior dimension of 40 by 50 feet (180 linear feet) and an average foundation wall depth below grade of 1.5 foot will require a minimum of 108 gallons. This works out to 0.6 gallons per linear foot ($0.4 * 1.5$) for our example building. Critical areas at corners, breaks and other areas will take additional termiticide.

For our example 2000 square foot building, we then need a minimum of 200 gallons for the sub-slab and sub-footer treatment and another minimum of 108 gallons for

the exterior foundation wall soil treatment, or a minimum of 308 gallons for the complete treatment. Real situations will include computations for the critical areas and will result in a more realistic total of 333 gallons. This allows for an 8% overage to cover the critical areas.

There are many ways for a soil treatment to be damaged or shorted on a construction site. First, if the soil is not level, certain areas can receive higher concentrations while other areas receive much lower concentrations. Second, there are never any dyes added to visually assist the operator during application, which can result in some areas getting lower concentrations. Third, the concentration at the hose nozzle can be altered by an improperly functioning automatic metering system or the flow meter can be purposely modified to reduce the concentration. Forth, the soil can be disturbed by workers or weather following the application.

Conventional soil treatments provide no easy way to verify the proper application of termiticide by anyone. Without dyes there is no way to make a quick visual inspection of where and roughly how much termiticide has been applied or if the barrier has remained intact since it was applied. Further, it is difficult and expensive to test the concentration of termiticide in the soil following an application.

Once the barrier is in place, water can cause the soil treatment to migrate or to be washed from the soil. Common sources of water close to a building include a leaking down spout or watering plants next to the building.

Under the best of conditions, the conventional soil treatment will breakdown over a period of time and become ineffective. A recent study by Professor Paul Baker at the University of Arizona showed that most soil barriers can break down in as little as 2 years in Arizona soils. A building without any soil treatment may go indefinitely without a termite infestation if the exterior around the building is kept cleared of decaying wood, if the soil is graded to keep water away from the building and if cracks and other openings are kept caulked and screened.

Once the soil barrier has deteriorated, a conventional wood frame building is totally unprotected. And as was just pointed out, a properly maintained building may never get a termite infestation as long as proper building maintenance is taken care of.

There is no way to know when the barrier is no longer effective other than to wait for the a termite infestation - hence the reason for getting an annual termite inspection. Detecting a termite infestation will provide the incentive to spend the money to reestablish the soil barrier. This is done by drilling the slab so that more termiticide can be pumped under the slab. Then another final grade treatment around the exterior of the building is done. And, of course, all of the damage from the drilling and termites will need to be repaired.

There are alternatives to conventional termite soil barriers that we will discuss later.

The cost of a soil barrier from a small company

Now that you have an understanding of conventional termite soil barriers, we can begin to look at the economics behind this system and the economic model termite businesses are built on. The economics for a small business doing low volume soil treatments is different from a large business specializing in high volume soil treatments. We will look at the economics of the small business first.

We start by looking at the cost of the horizontal soil barrier. The rate of application is required to be at least 1 gallon per 10 square feet, or 0.1 gallon per square foot. Here are some comparative costs per square foot for some of the leading termiticides purchased in relatively low quantity using the current Tucson, Arizona sales tax rate of 9.7%:

Termiticide	\$/SF w/tax	Basic cost
Bifen I/T (Bifenthrim 7.9)	\$0.1086	\$33/qt, 33gal, 0.06%
Masterline (Bifenthrim 7.9)	\$0.0559	\$51/0.75gal, 100gal, 0.06%
Premise 75	\$0.1053	\$96/bag, 100gal, 0.05%
Premise Pre-Construction	\$0.0609	\$555/2.15gal, 1000gal, 0.05%
Masterline (I MaxxPro)	\$0.1009	\$92/27.5oz, 100gal, 0.05%
PermethrimPro	\$0.0891	\$78/1.25gal, 96gal, 0.5%
Termador	\$0.1646	\$150/78oz, 100gal, 0.06%

Using the assumptions from our example 2000 square foot building, the vertical barrier will cost 6 times the above cost per linear foot:

Termiticide	\$/LF w/tax	Basic cost
Bifen I/T (Bifenthrim 7.9)	\$0.6516	\$33/qt, 33gal, 0.06%
Masterline (Bifenthrim 7.9)	\$0.3357	\$51/0.75gal, 100gal, 0.06%
Premise 75	\$0.6319	\$96/bag, 100gal, 0.05%
Premise Pre-Construction	\$0.3653	\$555/2.15gal, 1000gal, 0.05%
Masterline (I MaxxPro)	\$0.6055	\$92/27.5oz, 100gal, 0.05%
PermethrimPro	\$0.5348	\$78/1.25gal, 96gal, 0.5%
Termador SC	\$0.9873	\$150/78oz, 100gal, 0.06%

The total price of the termiticide for our example 2000 square foot building includes the 8% overage for critical areas and uses 333 gallons of termiticide:

Termiticide	Total w/tax	Basic cost
Bifen I/T (Bifenthrim 7.9)	\$361.65	\$33/qt, 33gal, 0.06%
Masterline (Bifenthrim 7.9)	\$186.30	\$51/.75gal, 100gal, 0.06%

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Premise 75	\$350.69	\$96/bag, 100gal, 0.05%
Premise Pre-Construction	\$202.74	\$555/2.15gal, 1000gal, 0.05%
Masterline (I MaxxPro)	\$336.08	\$92/27.5oz, 100gal, 0.05%
PermethrimPro	\$296.81	\$78/1.25gal, 96gal, 0.5%
Termador SC	\$547.95	\$150/78oz, 100gal, 0.06%

A small business will tend to use either the owner/operator or a seasoned technician to perform the application work. We will assume we are using a seasoned technician and the technician's fully burdened cost is \$30/hour. The building application will take two trips: one for the horizontal barrier and one for the vertical barrier.

The labor for the horizontal barrier includes:

Item	Time
Trip time	15 minutes
Fill tank	5 minutes
Mix termiticide	5 minutes
Apply termiticide	25 minutes (@10gal/min)
Rinse tank	5 minutes
Paperwork	5 minutes
 Total horizontal barrier labor	 60 minutes

The labor for the vertical barrier includes:

Item	Time
Trip time	15 minutes
Fill tank	5 minutes
Mix termiticide	5 minutes
Trenching and back fill	20 minutes
Apply termiticide (rod and flood)	20 minutes (@10gal/min)
Rinse tank	5 minutes
Paperwork	5 minutes
 Total vertical barrier labor	 75 minutes

The total labor for both barriers is 2 hour and 15 minutes or 2.25 hours. Thus the labor expense is \$67.50.

The expense involved in treating our example 2000 square foot building with Masterline (Bifenthrin 7.9), the least expensive product, is:

Item	Expense
Termiticide (least expensive)	\$186.30

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Labor	\$67.50
Total expense	\$253.80 (\$0.1269/SF w/tax)

The expense involved in treating our example 2000 square foot building with Termador SC, the most expensive product, is:

Item	Expense
Termiticide (most expensive)	\$547.95
Labor	\$67.50
Total expense	\$615.45 (\$0.3077/SF w/tax)

The numbers will vary depending on the exact situation. However, this example should clearly show the economics of creating the two required barriers from the small business perspective.

To operate a healthy company, you need to add a significant margin to cover insurance, equipment, warranty, other fixed and variable business expenses and profit. Somewhere between double and triple the total expense will provide a typical sales price for this job. Thus, a reasonable price range for the Masterline (Bifenthrin 7.9) treatment would be \$0.25 to \$0.38 per square foot including tax and \$0.62 to \$0.92 for the Termador SC treatment.

A small business will use the same truck, tanks and spray rig regularly used for other pest control applications when performing soil treatments. There is no practical benefit to investing in specialized equipment when performing low volume soil treatments because there will be no significant return on investment.

The cost of the soil barrier from a large business

Now let's turn to the economics of creating the soil barrier for a large business that does enough soil treatments that they can afford to purchase specialized equipment.

Generally, there are no volume discounts for termiticide from the distributor. On occasion, the manufacturer will make a rebate offer in the range of 20%. So purchasing a large supply of termiticide using the rebate program can allow a substantial increase to profitability. Large companies will usually have the financial clout to take advantage of such a rebate - purchasing and warehousing enough termiticide to carry them through to the next rebate - allowing them to purchase all of their termiticide at the lower price.

A large business can invest in specialized equipment that will enable one person to perform more soil treatments per day. For instance, a dedicated treatment truck with a 1000 to 1500 gallon water tank with automatic metering equipment can

eliminate much of the labor needed to fill the tank, mix termiticide and rinse the tank. Higher flow rates will reduce the time required to apply the termiticide. The use of specialized equipment can allow a technician to treat twice as many buildings per day as the smaller company. And the large business is likely to have contracts that allow less driving between treatment sites.

A specialized soil treatment truck can run in the \$70,000 to \$100,000 range. Thus, the cost must be amortized over a lot of soil treatments to provide a good return on investment. If you assume \$100,000 for the truck and amortize it over 5,000 treatments, the truck costs you \$20.00 per treatment. That is one penny (\$0.01) per square foot for our example 2000 square foot building. If you assume 6 treatments per day and 250 working days a year, you can amortize the truck in about 3.3 years.

Going back to the example above, we save roughly half the labor but add in the amortization from the specialized truck. The expense involved in treating our example 2000 square foot building with Masterline (Bifenthrin 7.9), the least expensive product, changes to:

Item	Expense
Termiticide (including 20% rebate)	\$149.04
Labor	\$33.75
Specialized treatment truck	\$20.00
 Total expense	 \$202.79 (\$0.1014/SF w/tax)

This is a drop in cost of \$0.025/SF over the cost for a small business.

The recent going rate for soil treatments in southern Arizona has been \$0.10 per square foot overall. We have received unconfirmed reports that some companies are now bidding in the \$0.08 to \$0.07 per square foot overall range due to the poor economy. This is well below the calculated square foot cost, and makes no provisions for business overheads such as insurance, office and the like.

How can you run a business by selling your services for below cost? Here are a few possible answers:

If you assume the soil treatments are a loss-leader, you have to assume there is a lucrative back end on the deal. The large businesses offering such a low initial soil treatment must be expecting to make up the loss by cashing in on a lucrative long-term termite service contract. If you do the initial soil treatments, you have first dibs at the perpetual service contract revenue stream. We will look at the economics of the perpetual service contract revenue stream in just a moment.

A darker interpretation involves price fixing to eliminate competition. There are very few small companies that can finance a multi-year loss in order to capitalize on

the perpetual service contract revenue stream. It is a business model only well-financed large business can afford.

Another darker interpretation involves fraud. Termiticide is the primary expense in a soil treatment - roughly 3/4 of the expense. If you lower the concentration of termiticide, you significantly lower your expenses. Referring back to Professor Paul Baker's research, most soil barriers break down within two years even when properly applied. And by just following basic building maintenance guidelines you have a high probability of keeping a building termite-free for years. We have also seen that it is difficult to determine if an effective barrier is currently in place and so it is almost unheard of that anyone tries to check the quality of the barrier. Thus we arrive at a low probability of detecting a poor soil treatment and a high probability of getting away with it if a poor soil treatment was done intentionally.

The lucrative perpetual service contract revenue stream

The original soil treatment is warranted for 5 years. The warranty starts with the application of the horizontal barrier. When this period is up, the company that did the original soil treatment will approach the building owner to sell more services. If a building has no evidence of termites, the pest control company will normally sell the building owner an annual service contract, which includes an annual inspection and covers any termite treatment that may be needed for as long as the service contract is kept in force. Smaller businesses will typically charge \$250 while large businesses often charge \$400 per year.

If there is evidence of termites, the infestation must be treated prior to providing the service contract. The consumer cost of creating a complete new soil barrier for an existing building can run \$1.00 to \$2.00 per square foot. The slabs must be drilled so that termiticide can be pumped under the slab along the interior of the foundation walls, around plumbing and other critical areas. The exterior will receive a conventional vertical barrier.

Full treatments are rarely done in favor of spot treatments. Spot treatments require the use of a contact termiticide that can kill the colony. Repellents will leave the colony intact and may simply result in the problem moving to a different location. The smaller business will usually perform a spot treatment and then place the building under a service contract. A larger business may require that the whole building be treated prior to putting the building under a service contract.

Once the building is under a service contract, a large business has a nice \$400 per year revenue stream coming in. The expenses associated with the contract are the annual inspection - perhaps three quarters of an hour of labor including driving time, and an occasional spot treatment whenever termites are detected. The spot treatment costs the business less than the annual service contract fee so even in a

year that requires a spot treatment, the business will at least break even. In most years the business will make a significant profit.

A small business with 500 service contracts at \$250 each will receive \$125,000 in revenue from those contracts. A larger business with 10,000 service contracts at \$400 each will receive \$4,000,000 in revenue from those contracts. A few businesses will have significantly more service contracts. As long as you maintain the contracts, the revenue stream just keeps rolling in. Even if you assume a 25% overhead, that is a 75% profit. As you might guess, large business will invest heavily to stop anything that will interfere with this very lucrative revenue stream.

To quote from the January 2004 issue of Pest Control magazine: "The entire focus of the residential side of its business is to generate termite renewal income. In one Eastern state alone, it has 100,000 termite renewal customers. You do the math."

Bait - the new kid on the block

The latest technology that some large termite businesses have embraced is bating. In simple terms, you install bait stations and add food to attract the termites. The food is poisoned so that the termites will eat the bait and thus take the poison back to the colony, eventually killing the colony. At least, that's how the theory goes.

From a marketing standpoint, bating is wonderful. No more "poisoning the ground" with a termiticide. The bait stations are "green" because they use growth regulators or metabolic inhibitors with neurotoxins. The termiticide goes straight from the bait station to the colony via the termites in low doses and is dispersed throughout the colony, eventually causing the colony to collapse. The problem is that bait stations often do not work. Termites often walk right by the bait stations without stopping.

The bait stations must be checked every couple of months by a technician so this adds up to perhaps 1.5 hours per year of labor plus driving time. However, there is usually a large upfront cost charged when the bait stations are initially installed - in the \$1200 range - and that will offset any increase in labor for the next decade or two.

And as long as there is a technician coming by to check the bait stations, it is easier to piggyback other services for a low additional cost - such as weed or insect pest control. This is a marketing bonanza for the large businesses.

The bait stations fit vary nicely with the existing lucrative perpetual service contract revenue stream.

How to stop your competition and grow rich

Now we can put the whole model together and show you the insidious nature of it.

As we have just seen, there is a lot of money associated with the service contract revenue stream. A large termite business that has been around for some time already has a revenue stream worth millions of dollars a year. That revenue stream is used to offset losses caused by selling initial soil treatments at below cost. The loss has to be financed for 5 years before the loss can be turned into a profit but this is easily done with the existing revenue stream.

No small family business can afford to start off with taking a loss for 5 straight years. Thus, new competitors are effectively excluded from entering the termite industry. This is a serious barrier to entry.

Many older small businesses were systematically destroyed over the last 10 years. Several such events were chronicled in the Its-Our-Turn.com white paper "Corruption in the Arizona Pest Control Industry."

Many other older small businesses have dropped out due to age, illness, economics and various other reasons. As the years go by, there are fewer and fewer small businesses left in the termite industry.

In the end, all you are left with is a small number of large businesses. The model and current laws and rules effectively stop most new competition from entering the market. The lucrative perpetual service contract revenue stream keeps the large business well financed and keeps the large business in a position to purchase influence in the legislature, bending the regulations to their continued advantage.

How to destroy the service contract revenue stream

Now that you understand the economics of the current termite industry and the cash cow called the service contract revenue stream, it should be easy to guess what would put the fear of God in the hearts of the large termite pest control businesses. It is simply anything that will destroy the service contract revenue stream. Is that even possible?

Termites eat wood. If there is no edible wood, there will be no termites. The current termite industry depends on the fact that houses contain large amounts of edible wood that can be infested with termites. This suggests a simple strategy for permanent termite control - poison or encapsulate the wood. Let's take a look at each.

Borates have been around for a long time. They are naturally occurring compounds that are common in the environment and are mined in vast quantities. The two common unrestricted borate compounds - disodium octaborate tetrahydrate and zinc borate - are essentially harmless to people and pets while disrupting the

nutrient uptake in termites. The borates essentially work by starving the termites to death – and there is no possible immunity for starvation. If you treat the wooden structure of a building, the structure cannot get termites. Not now, not next year, not ever.

There are two ways to use borates during construction. The first is to simply spray the wooden structure once it is built but before the walls have been enclosed. Products such as Bora-Care by Nisus Corp. - disodium octaborate tetrahydrate mixed with glycol - is specifically designed to penetrate untreated wood. They even recommend adding a dye to make it easy to tell where you have sprayed. And they can provide a simple test kit that allows you to test the sprayed wood after application to verify it was properly treated. Easy to apply, easy to inspect and easy to confirm proper treatment. Oh, and Nisus will provide the building owner with a 25 year warranty that covers termite damage.

You can also spray the concrete to eliminate tubing. Termites will not cross a borate treated surface. Dry borates form tiny crystals that get into the termite's exoskeleton and shred their joints - death by a thousand cuts.

And as a bonus, spray-on treatments such as Bora-Care also work against ants, beetles, mold and fungus.

The second way to use borates during construction is to purchase commercial lumber that has been pressure-treated with these compounds. So now you can purchase all of your wooden structural and framing members and wood sheathing and decking and know you are building a termite-proof building. And the protection is good for the life of the building.

It is also possible to pressure treat wood with sodium silicate to protect the wood from termites and fire. This process essentially encapsulates the wood fibers in an amorphous glass. This not only makes the wood termite proof, it also makes the wood fireproof. This treatment also prevents rot and decay. This product is produced by TimberSil Wood.

All of these products have one thing in common - they completely eliminate the need for any soil treatment when you put up the building and they completely eliminate any need for the expensive annual termite service contract. And this is what puts the fear of God into the large termite companies. If the building industry converted over to these products, the existing termite industry would eventually collapse.

So how have the large termite businesses discouraged the adoption of these new technologies? Refer back to rule R4-29-305.E. Using Bora-Care as an example, you are still required to spend money and create a vertical barrier even though the Bora-Care label says no vertical barrier is required. In fact, no vertical barrier is even recommended for use with Bora-Care. This adds unnecessary expense to the

building and may tip the tables enough to stop the application of the borate treatment.

Even if rule R4-29-305.E is eliminated, as it should be, the cost of treating wood with Bora-Care with a reasonable profit is roughly \$0.35 - \$0.70 per square foot depending on the degree of treatment. This is significantly higher than \$0.10 per square foot charged by the large soil treatment companies. The typical tract homebuilder may not be able to pass on the additional cost to his customer and so will choose the lower cost treatment - at the expense of the long-term cost of ownership.

Rule R4-29-305.E is anti-consumer. It encourages the customer (and builders) to choose the more expensive cost of ownership. And it forces consumers to purchase a treatment that has a limited lifespan when the consumer would be better served to purchase a permanent treatment.

As with power efficient appliances, insulation and other higher-end features, using termite-proof materials or treatments will start with the custom homebuilders selling into a less price sensitive market. These builders have customers who can easily see the long-term financial benefit. These customers will gladly pay more up front for a lower cost of ownership. As time goes on, the use of permanent treatments will spread to other segments of the market.

Summary

In summary, the current large soil treatment businesses have a vested interest in maintaining the current soil treatment system and the associated economic model because they derive a large perpetual revenue stream from it. They are willing to sacrifice initial profit for a much larger future profit. Eliminating the need for termite service contracts threatens their economic model and they will lobby strongly to prevent that from happening.

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