ASPCRO Soil Sampling Procedure

Introduction

A continuous barrier of properly treated soil immediately adjacent to the foundation of a conventional crawlspace structure or under the foundation of a typical concrete slab construction is the single most important element of all termite control treatments. Each of us agrees that there are three primary "critical" areas of a typical crawlspace house: the inner foundation wall (IFW), the outer foundation wall (OFW), and the foundation pier (FP).

The critical areas of a concrete slab foundation structure can be sampled: the open slab area (OSA), the inner foundation wall (IFW), the outer foundation wall (OFW), pipes and conduit (pipes), and the hollow voids, if earth filled (void). Obviously, if the inspection is post construction, you would likely only sample the outer foundation (OFW).

Soil sampling is a valuable tool to assure that the label directions have been followed and to establish whether a complete continuous chemical barrier of sufficient concentration is present around a structure.

Procedure

1. Samples will be obtained from treated structures within six months of treatment completion date. Samples should not be taken in areas where prejudicial conditions beyond the control of the operator exist (e.g., below drains or faucets).
2. The critical areas of crawlspace strictures and the critical areas of a concrete slab foundation can be sampled. Since inadequate treatment in any of these areas may leave the entire structure vulnerable to attach by termites, the inspector should attempt to assess the complete treatment by sampling these critical areas of the structure. (See Introduction)
3. Soil samples will be obtained by the following procedures:

    1. Remove the top one-half inch of soil and any debris and vegetation as necessary to yield a reasonably clean sample.
    2. Use a soil core extractor with an approximate inside diameter of one inch to obtain all soil cores.
    3. From each designated treatment site (e.g., IFW, OFW, FP, Pipe, Void) obtain the soil to produce two representative samples. The representative sample would consist of a minimum of eight (8) cores from each sampling area within the treatment site. Each sample will be a composite of individual cores which are obtained at the rate of a minimum of two cores per side of the structure, for the inner and outer foundation wall samples, as well as voids. For the foundation pier samples, pull one core from each side of a

minimum of two piers to obtain the required eight (8) cores. For pipe samples, obtain one core from each side of a minimum of two pipes per sample for the required (8) cores.

4. When sampling the open slab area (OSA) on pre-construction treatment, obtain the cores in a random pattern to a depth of two (2) inches. The two-inch depth is determined by a penetration study conducted by the USDA-FS at Gulfport, MS. This study showed that at the one gallon per 10 ft^2 rate you get two (2) inches of penetration of the liquid solution, in the soil. Increase the number of cores to a minimum of twenty-four (24) to yield a suitable volume of soil for each sample.
5. After preparing area as noted above, extract each core necessary to a depth of six (6) inches, no more than two (2) inches from the adjacent construction element (except as noted in 4 above). Enclose the sample in a properly numbered and labeled container for transporting to the Laboratory. All samples will be immediately placed in a soil sample box, foil lined bag, or other suitable container and will remain in this container until reaching the laboratory. All samples should be shipped to a central Laboratory within seventy-two (72) hours or maintained at a reasonably stable temperature at all times, not to exceed seventy-five (75) degrees Fahrenheit until shipment to the laboratory. This can be easily accomplished by placing the samples in a cooler with blue ice or an equivalent, and then placing the sample in the inspector's office. Do not allow the sample to be left in a vehicle for an extended period of time, unless in a cooler with the temperature stabilized.
6. The chain of custody should be maintained on all samples. A document signed by all persons responsible for the integrity of the samples should accompany the sample to the Laboratory. This document should also be signed by lab personnel when the sample arrives at the residue laboratory. This document should be maintained as part of the case file.
7. The two samples which are taken from the appropriate critical area and analyzed will be interpreted in the following manner
    - Both Samples Pass=PASS
    - One Samples Passes;
      One Sample Fails=PASS
    - Both Samples Fail=FAILURE
8. If any two samples from a critical area fail to yield the necessary residues (as noted in Chart A), the sample will be considered a failure and the appropriate action should be taken. The samples obtained from the open slab area (OSA) are taken from soil which has been treated at the rate of one gallon (1 gal.) per 10 ft.2 (Or equivalent). This equates to seventy-five percent (75%) of the four gallons per ten linear foot rate. (See Explanation below). Thus, we will expect to find seventy-five percent (75%) of the residues

required of the area receiving the four gallons per ten-foot rate (See Chart A). The PCO may not be required to retreat an OSA after concrete has been poured, However, if soil samples obtained from this area fail, this will be considered a violation.

Explanation

The 4 gallons per 10 ft. rate treats a total volume of five cubic feet (5 $ft.^3$) of soil. This can be easily calculated by looking at the label for termiticide products which states that the trench should be at a minimum six inches (6 in.) wide by one foot (12 in.) deep, assuming a minimum of one foot of depth. Then, focus on one ten-foot (10 ft.) section of soil adjacent to a foundation element.

6 in. x 12 in. = 72 $in.^2$
72 $in.^2$ x 120 in. = 8,640 $in.^3$
8,640 $in.^3$ x 1 $ft.^3$ /1,728 $in.^3$ = 5 $ft.^3$

Application Rate

4 gallons/10ft. = 4 gallons/5 $ft.^3$
This rate then equates to:
.8 gallons/$ft.^3$

The 1 gallon per 10 $ft.^2$ rate treats a total volume of 1.66 $ft.^3$ of soil. This also can be easily calculated by looking at the label for termiticide products which states that the rate of application is one gallon (1) per ten square feet (10 $ft.^2$). This could be an area two foot (2 ft.) by five foot (5 ft.). As was earlier discussed, we know that the depth of penetration is two inches (2 in.).

24 in. x 60 in. = 1,440 $in.^2$
1,440 $in.^2$ x 2 in. = 2,880 $in.^2$
2,880 $in.^2$ x 1 $ft.^3$ /1,728 $in.^3$ = 1.66 $ft.^3$

Application Rate

1 gallon/10 $ft.^2$ = 1 gallon/1.66 $ft.^2$
This rate then equates to:
.6 gallons/$ft.^3$

The comparison between the actual rate of application per cubic foot ($ft.^3$) of soil between the rates of 1 gallon per 10 $ft.^2$ and 4 gallons per 10 ft. shows that the 1 gallon/10 ft. receives 75% of the 4 gallon/10 ft. rate.

.6 gallons/.8 gallons x 100 = 75%

Termiticide Soil Residue Requirement

CHART A

Termiticide	Days Post-Treatment	PPM* 4 Gallons/10 Ft.	PPM 1 Gallon/10 Ft.^{2}
Torpedo	1 through 180	63	47
Tribute	1 through 180	110	83
Prevail FT	1 through 180	46	35
Demon TC	1 through 180	28	21
Dragnet FT	1 through 180	81	61
Dursban TC	1 through 180	51	38

PPM*: These are the lowest expected threshold values (expressed in part per million) based upon the fifth percentile estimations. These ppm values were calculated by taking the fifth percentile projection and measuring the rate-of-decay as seen in this study. These values were then confirmed by Dr. Brian Forschler of the University of Georgia.