

## ASPCRO Guidance Document for Soil Sampling

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Enclosed you will find the results from the Association of Structural Pest Control Regulatory Officials (ASPCRO) Soil Residue Data Collection Project. We have evaluated seven termiticides, six of which are currently registered. You may recall, the design and implementation of this study are the result of direct participation from the pesticide manufacturers, the Pest Control Industry (through NPCA), and ASPCRO. This Guidance Document is the net result of the findings of this study.

Soil sampling has been, and will continue to be, one of the many tools State Regulatory Agencies use in their respective programs. The purpose of this Document and this study is to:

1. Evaluate "by-the-label" termiticide applications performed by pest control operators and measure expected soil residue values under field conditions.
2. Provide guidance to State Regulatory Agencies regarding how to interpret the findings of this investigation.
3. Provide guidance for implementation of study findings into respective State programs.

This study was conducted in four (4) states (Arizona, Georgia, Indiana, Oklahoma). In each state, there were three groups of seven (7) structures, for a total of twenty-one (21) structures per state. Each of the seven structures in each group was treated with one of the seven termiticides included in the study. (See Table 1. Below)

**Table 1**

<b>State</b>	<b>Number of Groups and Structures</b>	<b>Number of Structures</b>
ARIZONA	3 groups of 7 structures	21
GEORGIA	3 groups of 7 structures	21
INDIANA	3 groups of 7 structures	21
OKLAHOMA	3 groups of 7 structures	21
	<b>TOTAL NUMBER OF STRUCTURES IN THE STUDY</b>	<b>84</b>

Soil samples were obtained:

- Just prior to the treatment,
- Immediately after the treatment,
- Thirty (30) days after the treatment,
- 120 days after treatment,
- 365 days after treatment.

The enclosed results of this study were statistically evaluated by Mr. Bernie Parresol, who is a Mathematical Statistician with the USDA Forest Service, Southern Forest Experiment Station, Institute for Quantitative Studies, in New Orleans, Louisiana. Mr.

Parresol indicated to us that the data generated in this study were not normally distributed, which is not an uncommon occurrence in scientific studies. Thus, Mr. Parresol used what is known as a three-parameter Weibull model to evaluate data distribution. The net result of this evaluation was that the data fit this model very well. This model is the best method for establishing a lower threshold value. The Weibull is a theoretical distribution with three parameters that is useful for modeling certain types of data. Thus, Mr. Parresol was able to calculate the estimated parts per million lowest threshold values for the termiticides in this study (See Chart B). The estimated residue amounts were then projected using percentiles. As you can see from the enclosed documents, those estimates are represented as the first, fifth, tenth, and fifteenth percentiles. A brief explanation of these percentiles would be, for example, the fifth percentile shows that 95% of the residue amounts would be equal to or greater than the estimated fifth percentile parts per million values.

The USDA Forest Service, Southern Forest Experiment Station, Gulfport, Mississippi, has shown in earlier studies (Kard, McDaniel, et. al) that first order Kinetics applies to the rate-of-decay of termite control pesticides in soil. Using the first order Kinetics calculations, Dr. Skip McDaniel was able to project residue amounts based upon the rate-of-decay as seen in this study. (See Chart A)

At the request of the National Pest Control Association (NPCA) we had an independent review of this study done by Dr. Brian Forschler of the University of Georgia. His evaluation of the ASPCRO soil residue study is enclosed for your information (See Table 2). The evaluation by Dr. Forschler was initially to address the appropriateness of the statistical model used to project the residue amounts for this study. However, as one can see, Dr. Forschler went on to evaluate the projected residue estimates, based upon the degradation of the pesticides as seen in this study and the dual sampling recommendation made in the December 1994 Guidance Document. (You will recall the dual sampling strategy states that two separate composite samples will be taken from a single target site and both samples would have to fall below the residue requirement before the samples would be considered a failure).

Dr. Forschler also made certain statistical observations of his own as seen in Table 2 (Below). Dr. Forschler recommends, with two minor exceptions, the Day 180 projections be used from Day 1 through Day 180 to evaluate soil residues. He further states that, by using these projections, "These requirements can be justified by the entire data set which shows 0.9% of the samples fail to meet these standards and none of the sites would have been cited for failure to meet Regulatory Requirements based on the 2 out of 2 failed samples criterion."

Thus, the independent evaluation says that according to the set of data collected in this study, if we use the 180-day projections from Day 1 - Day 180 and use the dual sampling strategy, none of the samples would have been unfairly interpreted as failures.

**Table 2**

<b>Termiticide</b>	<b>Parts Per Million PPM</b>
Tribute	110
Dragnet	81
Torpedo	63
Prevail	46
Demon	28
Dursban	51
Pryfon	N/A

**Note:**

These are the recommended residue requirements of the termiticides included in the ASPCRO Soil Residue Study. These are the expected amounts found in samples taken within 180 days of the treatment date.

### **RECOMMENDATIONS**

1. Individual soil core samples should be taken using a standard sampling procedure. A composite sample consists of eight individual one-inch diameter cores taken to a depth of six (6) inches that have been combined. Two individual cores should be taken from each side of the structure (with the understanding that there will be four general sides of each structure).
2. The recommendation from the Soil Residue Committee is that no regulatory action should be taken based upon one individual soil sample. When you obtain multiple soil core samples from treated structures, and combine them into a composite sample, you ensure that the samples represent a true and fair picture of the treatment.
3. ASPCRO recommends the States implement a strategy which would include no less than two composite samples from a critical area (i.e., outer foundation wall, inner foundation wall, or foundation pier) for consideration.
4. ASPCRO recommends that soil core composite samples be obtained within six (6) months of the treatment date. ASPCRO is confident that the projected estimates for six (6) months can be used as a valid regulatory tool. Additionally, this provides a significant "benefit of doubt" to the applicator.
5. ASPCRO recommends that Dr. Forschler's suggested Residue Requirements as seen in Table 2, be used by states for evaluation of soil samples for regulatory purposes, following treatment for subterranean termites.
6. ASPCRO recommends that the states, when feasible or appropriate, allow the pest control operator (PCO) to observe collection of the soil sample.
7. If the PCO requests, make part of the soil samples (split sample) from the respective state residue analysis laboratory available to a competent and qualified private laboratory for independent analysis.