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Efficacy of Imidacloprid and Bifenthrin as a Repellant to Formosan Termites

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ABSTRACT

Termite damage in the USA amounts to over 11 billion dollars annually. For the majority of the homes in the United States, very few were constructed with treated wood, with the exception of code required treated wood sill plates. It has become common practice, especially in termite laden areas, like LA, MS, FL, NC, SC, GA, and HI to spray the wooden framing members while the home is under construction, and normally in the roofed-in phase, of the rough framing. Today, many options for this on-board, framed-in application exists, with the majority of the Pest Control Operators (PCO's) using borates, or borates coupled with insecticides and fungicides. This study investigates two completely different Mode-of-Action (MoA) insecticides for this possible and ever-increasing use pattern.

Keywords: termites, insecticides, repellant, non-repellant, efficacy, Standardized testing, experimental testing

INTRODUCTION

Insecticides have been used as wood protectants for over two centuries. This paper examines the uses of a non-repellant neo-nicotinoid product, Imidacloprid, comparing its efficacy to a synthetic pyrethroid, Permethrin. With the ever increasing costs of natural Pyrethrum increasing, and reduction in the growing fields of Chrysanthemums due to poppy fields and other illegal drug precursors being grown in their place, synthetic pyrethroids have been growing in use patterns over the last twenty years. This paper summarizes the work at the LSU-Wood Durability lab, for the control and mitigation by two insecticides with two completely different modes of action. Each of these two insecticides tested have grown in popularity in the pest control (PCO) market and the wood protection market since first, the elimination of Lindane also known as *gamma*-hexachlorocyclohexane or (γ -HCH) followed about ten years later by the elimination of Chloropyrifos (CPF).

MATERIALS AND METHODS

The two insecticides included in this study included Bistar[®] WT from FMC Corp. (Princeton, NJ) and Preventol[®] TM CE 25 from LANXESS Corp. (Pittsburgh, PA). The Bistar[®] WT had a 23.0% active ingredient (bifenthrin) concentration but specific gravity was not provided. A diluted solution of the Bistar[®] WT was produced by reducing the active ingredient (a.i.) concentration to 2.5%. The 2.5% a.i. of Bistar[®] WT was produced on a weight basis by diluting 108.7 g of Bistar[®] WT to 1,000 g (108.7 g Bistar[®] WT + 891.3 g water) and mixing well. All subsequent dilutions for the Bistar[®] WT were made from this diluted solution. This was done to simplify measurement of each insecticide for preparation of treatment solutions. Preventol[®] TM CE 25 had a specific gravity of 1.012 and an active ingredient (imidacloprid) concentration of 2.5%.

Untreated southern yellow pine (SYP) 2x4 stud grade lumber was locally purchased and cut to 18 in. lengths to serve as the towers. Alkaline copper quaternary (ACQ)-treated 2x4 stud grade lumber was also locally purchased and cut into 14 in. lengths to serve as the sill plates.

Three untreated SYP boards were evenly distributed along the treated sill plate and connected by nails to constitute one assembly. There were three assemblies, representing nine total samples, for each insecticide and one for the untreated controls for a total of 21 samples (Table 1).

The Preventol[®] TM CE 25 was spray-applied at 3 concentrations (i.e., 0.20%, 0.60%, and 1.20%, which corresponded to 0.005%, 0.015%, and 0.03% a.i. The diluted Bistar[®] WT was spray applied at 3 concentrations (i.e., 0.005%, 0.015%, and 0.03% of a.i.). These levels were consistent with the products US EPA registered use levels for soil application. The boards were sprayed to point of run off on September 19, 2008. Additional mixing information is provided in Appendix 1. The boards were sprayed when dried, till right before run-off, and then a 1-in. (2.54 cm) hole was drilled in one board and a 1 in. notch was cut in another board in each assembly. One board from each assembly was left undisturbed. The two insecticides were sprayed in separate rooms, using separate sprayers and glassware, and allowed to dry in separate rooms to avoid cross contamination. This effort was made since, historically, no data has ever been presented to the US EPA database, claiming

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repellant action of neonicotinoid insecticides; in fact, all current advertising for neonicotinoid based products, specifically claim “non-repellant.”

Each assembly was placed on a plastic tray, and the tray was then placed inside a 15-gal metal tub. A small amount of water was added to the tub after the tray was inserted so that any termites that escaped the tray would drown and die, as not to infest the testing facility. For each tray, 500g of sand, 100g of water, and 2,000 adult Formosan termites were added. A Petri dish full of water was added to each assembly. A small wet towel was added to each assembly and served as a wick between each Petri dish and the sand to ensure that termites did not die from lack of available moisture. The soil was checked daily to ensure it was damp. The Petri dish was checked regularly and kept full of water.

Written observations were taken at predetermined periods (Appendix). Moreover, digital images were recorded at each observation period and all were made available to the sponsor(s) upon request.

The test was started on September 22, 2008. The test was ended after 4 days due to high mortality. Observations were to be made every 5 minutes of the 1st hour, ever 20 minutes for the next 2 hours, every hour for the final 5 hours. Then for the following 3 days, observations were made every hour of each day for an 8 hour period (Appendix 2). Digital photos were also taken during these observation intervals.

To ensure termite vigor, an American Wood Protection Association (AWPA) E1-06 test was conducted using the same termites used in the test described herein. The E1-06 test did not end until 28 days from the start date of the tower test (September 22, 2008). These results will be available to the sponsor upon request.

Table 1. Experimental set up of all 21 samples.

Sample ID	Treatment	Active	Concentration	% a.i.	Condition
1	Preventol TM CE 25	Imidicloprid	0.20%	.005	solid
2	Preventol TM CE 25	Imidicloprid	0.20%	.005	1"square
3	Preventol TM CE 25	Imidicloprid	0.20%	.005	1"hole
4	Preventol TM CE 25	Imidicloprid	0.60%	.015	solid
5	Preventol TM CE 25	Imidicloprid	0.60%	.015	1"square
6	Preventol TM CE 25	Imidicloprid	0.60%	.015	1"hole
7	Preventol TM CE 25	Imidicloprid	1.20%	.03	solid
8	Preventol TM CE 25	Imidicloprid	1.20%	.03	1"square
9	Preventol TM CE 25	Imidicloprid	1.20%	.03	1"hole
10	Diluted Bistar WT	Bifenthrin	0.20%	.005	solid
11	Diluted Bistar WT	Bifenthrin	0.20%	.005	1"square
12	Diluted Bistar WT	Bifenthrin	0.20%	.005	1"hole
13	Diluted Bistar WT	Bifenthrin	0.60%	.015	solid
14	Diluted Bistar WT	Bifenthrin	0.60%	.015	1"square
15	Diluted Bistar WT	Bifenthrin	0.60%	.015	1"hole
16	Diluted Bistar WT	Bifenthrin	1.20%	.03	solid
17	Diluted Bistar WT	Bifenthrin	1.20%	.03	1"square
18	Diluted Bistar WT	Bifenthrin	1.20%	.03	1"hole
19	Untreated SYP		--		solid
20	Untreated SYP		--		1"square
21	Untreated SYP		--		1"hole

Note: Bistar[®] WT was diluted to 2.5% as described in the Materials and Methods above.

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OBJECTIVES

The purpose of this study was to compare the repellency of two spray-applied commercial insecticides to Formosan subterranean termites (*Coptotermes formosanus* Shiraki) in a laboratory setting. The intent was to simulate framing lumber attached to a preservative-treated sill plate commonly used in residential housing. The specific objectives were as follows:

1. Determine if Preventol[®] TM CE 25 is a contact repellent.
2. Compare Preventol[®] TM CE 25 with another commercial insecticide.
3. Determine what concentration is efficacious of Preventol[®] TM CE 25 and the other commercial insecticide.
4. Determine the effect of comprising the envelope of protection from the preservative (i.e., drilling a hole and cutting a notch) on termite repellency.

RESULTS

Once the termites were added to the assemblies the termites immediately dispersed, some began to go up the towers while others remained on the sand. This observance is common place in this sort of test assembly. For the first hour, both sets of the termites were very active moving up and down all of towers, even for the repellent action Permethrin. We thought this was unusual. The termites were first observed in the holes and notched areas of the assemblies treated with Bistar[®] WT at 0.03% a.i. as soon as 15 minutes after treatment.

In general, there seemed to be more activity on all wood treated with Bistar[®] WT than on the wood treated with Preventol[®] TM CE 25. In general, the higher concentrations did not provide better repellency than the lower concentrations. In fact, the 0.005% a.i. of Preventol[®] TM CE 25 consistently showed the best repellency throughout the test. It appeared as if the Bistar[®] WT was acting more as an attractant rather than a repellent. This situation became evident 20 minutes into the test and continued until the later stages of the test when mortality became high on all treated towers.

Mortality first became evident at 60 minutes into the test. The termites as an entire colony are quite destructive, but individual termites are remarkably fragile. The handling of the termites likely injures and stresses the termites resulting in gradually increasing mortality even though adequate moisture is available.

The second hour of the test yielded similar findings as the first hour in terms of a general abundance of termite activity on all towers, more activity on Bistar[®] WT towers and less on Preventol[®] TM CE 25 treated wood. There appeared to be less activity in the holes and notches in the second hour than in the first hour.

On day one, the termite activity began to dramatically decrease starting after 6 hours and continued until the 8th hour inspection. Dead termites were not overly evident on the towers. The termites were largely present on top of the sand of the treated towers during this stage of the test. Moreover, unusually large numbers of termites had gathered under the Petri dish in each assembly.

Day two observations were made every hour. The treated towers had high mortality on the sand and the sill plate on day two for both treatments. Activity on the treated towers greatly decreased. The Bistar[®] WT towers continued to show more activity. This should be an indicator of the non-repellant action of most neoniointinoid-based pesticides, as they consume product for the mortality mode of action, rather than starving due to repellent action driving them away from food stuffs. The control towers were still active and showed little mortality. Mortality for the Bistar[®] WT towers was estimated to be much greater than those of the Preventol[®] TM CE 25 towers. For example, on the 5th hour of day two, mortality of the Preventol[®] TM CE 25 towers ranged from 5-15 termites while mortality ranged from 120-240 on the Bistar[®] WT towers.

Day three observations were made every hour. The activity on the treated towers began low and ended even lower. At the start of day three only one tower had more than 10 termites on it. By the end of the day, all towers contained single digit numbers of termites some (i.e., all of the 0.005% a.i. Preventol[®] TM CE 25 and one of the 0.015% a.i. Preventol[®] TM CE 25) contained zero. Mortality on the Bistar[®] WT towers continued to increase.

On day four, termite activity was very minimal on all towers. The exception was tower #9 (Preventol[®] TM CE 25 0.03% a.i., with a 1-in. hole). This abnormality was a continuation from previous days in which the Preventol[®] TM CE 25 towers with the higher a.i. had higher termite activity. However, the other two towers in the assembly did not show high activity. This observation cannot be explained without statistical replication. By the end of the fourth day the activity numbers were getting so small that comparisons were no longer meaningful.

At the end of the test, large numbers of termites were found alive under the sill plate and under the Petri dishes in each treated assembly with lesser numbers in or on top of the sand. For the untreated assembly at the end of the test, the majority of the live termites were found on the sill plate with much fewer numbers under the sill and Petri dish. It is likely that the relative humidity was highest under the sill and Petri dish, and therefore, the termites migrated to these areas. Moreover, our previous work has shown that termites prefer tightly confined areas. Therefore, the first few days were spent exploring their new area while the later few days were spent adapting to the new area. Consequently, for the purposes of this test, repellency is best evaluated in the earlier stages of this test when the termites were most curious, active, and vigorous.

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CONCLUSIONS

Based on the results of this study, the following conclusions can be drawn to address the four objectives of this experiment.

1. Preventol[®] TM CE 25 is a non-repellant with documented insect efficacy. However, it was not 100% effective at repelling termites at any time during the test.
2. Preventol[®] TM CE 25 compares favorably with the commercial insecticide Bistar[®] WT.
3. The lowest concentration of Preventol[®] TM CE 25 and Bistar[®] WT that were efficacious was 0.005% a.i. and 0.03% a.i.%, respectively. It is interesting to note that the lowest level of Preventol[®] TM CE 25 was the most efficacious while the highest level of Bistar[®] WT proved the best. The lowest level of Preventol[®] TM CE 25 clearly outperformed all levels of diluted Bistar[®] WT.
4. Once the envelope of protection offered by the preservative is compromised (i.e., drilling a hole and cutting a notch), termite efficacy is severely compromised in these areas in the short term. In the long term (i.e., 4 days), both preservatives provided some resistance, even in the holes and notches, to termite activity at all concentrations. It should be noted that the resistance was not complete as termites were active on many of the treated towers throughout the test.

It should be noted that there was no true replication in this test. Therefore, no statistical analysis was performed.



Figure 1. Typical experimental assembly of one group of samples.



Figure 2. Initial dispersion pattern of termites throughout the sand immediately upon being placed on the sand.

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Figure 3. The termites were very active on some towers as soon as 20 minutes into the test. This particular assembly consistently had relatively higher termite activity throughout the test.



Figure 4. Termites were active in the machined areas of the samples. Note the termite activity in the notch of the Sample 20 (untreated control).



Figure 5. Low termite mortality on a sill plate on day two.

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Figure 6. High termite mortality in the sand and sill on the fourth day of the test.

APPENDIX 1. PREPARATION OF EACH INSECTICIDE FORMULATION

ID	Treatment Label	% Concentrate	a.i.	Solution Mixture (1L)
1	Preventol TM CE 25	0.20%	0.005%	2g Preventol + 998g H2O
2	Preventol TM CE 25	0.20%	0.005%	2g Preventol + 998g H2O
3	Preventol TM CE 25	0.20%	0.005%	2g Preventol + 998g H2O
4	Preventol TM CE 25	0.60%	0.015%	6g Preventol + 994g H2O
5	Preventol TM CE 25	0.60%	0.015%	6g Preventol + 994g H2O
6	Preventol TM CE 25	0.60%	0.015%	6g Preventol + 994g H2O
7	Preventol TM CE 25	1.20%	0.030%	12g Preventol + 988g H2O
8	Preventol TM CE 25	1.20%	0.030%	12g Preventol + 988g H2O
9	Preventol TM CE 25	1.20%	0.030%	12g Preventol + 988g H2O
10	Diluted Bistar WT	0.20%	0.005%	2g 2.5% Bistar WT + 998g H2O
11	Diluted Bistar WT	0.20%	0.005%	2g 2.5% Bistar WT + 998g H2O
12	Diluted Bistar WT	0.20%	0.005%	2g 2.5% Bistar WT + 998g H2O
13	Diluted Bistar WT	0.60%	0.015%	6g 2.5% Bistar WT + 994g H2O
14	Diluted Bistar WT	0.60%	0.015%	6g 2.5% Bistar WT + 994g H2O
15	Diluted Bistar WT	0.60%	0.015%	6g 2.5% Bistar WT + 994g H2O
16	Diluted Bistar WT	1.20%	0.030%	12g 2.5% Bistar WT + 988g H2O
17	Diluted Bistar WT	1.20%	0.030%	12g 2.5% Bistar WT + 988g H2O
18	Diluted Bistar WT	1.20%	0.030%	12g 2.5% Bistar WT + 988g H2O
19	Untreated SYP	none	none	none
20	Untreated SYP	none	none	none
21	Untreated SYP	none	none	none

Note: Bistar[®] WT was diluted to 2.5% as described in the Materials and Methods above.

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APPENDIX 2. VISUAL OBSERVATIONS

Note: Bistar® WT was diluted to 2.5% as described in the Materials and Methods above.

Day one, hour one; observations every 5 minutes.

Hour One, 5 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	3			
2		0.20%	0.005%	1"square	9/22/08	2			
3		0.20%	0.005%	1"hole	9/22/08	5			
4	Preventol	0.60%	0.015%	clear	9/22/08	6			
5		0.60%	0.015%	1"square	9/22/08	4			
6		0.60%	0.015%	1"hole	9/22/08	10			
7	Preventol	1.20%	0.03%	clear	9/22/08	3			
8		1.20%	0.03%	1"square	9/22/08	2			
9		1.20%	0.03%	1"hole	9/22/08	3			
10	Diluted Bistar WT	0.20%	0.005%	clear	9/22/08	15			
11		0.20%	0.005%	1"square	9/22/08	20			
12		0.20%	0.005%	1"hole	9/22/08	20			
13	Diluted Bistar WT	0.60%	0.015%	clear	9/22/08	8			
14		0.60%	0.015%	1"square	9/22/08	5			
15		0.60%	0.015%	1"hole	9/22/08	30			
16	Diluted Bistar WT	1.20%	0.03%	clear	9/22/08	2			
17		1.20%	0.03%	1"square	9/22/08	10			
18		1.20%	0.03%	1"hole	9/22/08	10			
19	Untreated	none	none	clear	9/22/08	12			
20		none	none	1"square	9/22/08	10			
21		none	none	1"hole	9/22/08	10			

Hour One, 10 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	8			
2		0.20%	0.005%	1"square	9/22/08	2			
3		0.20%	0.005%	1"hole	9/22/08	10			
4	Preventol	0.60%	0.015%	clear	9/22/08	8			
5		0.60%	0.015%	1"square	9/22/08	6			
6		0.60%	0.015%	1"hole	9/22/08	7			
7	Preventol	1.20%	0.03%	clear	9/22/08	2			
8		1.20%	0.03%	1"square	9/22/08	2			
9		1.20%	0.03%	1"hole	9/22/08	4			
10	Diluted Bistar WT	0.20%	0.005%	clear	9/22/08	12			
11		0.20%	0.005%	1"square	9/22/08	20			
12		0.20%	0.005%	1"hole	9/22/08	20			
13	Diluted Bistar WT	0.60%	0.015%	clear	9/22/08	6			
14		0.60%	0.015%	1"square	9/22/08	2			
15		0.60%	0.015%	1"hole	9/22/08	18			
16	Diluted Bistar WT	1.20%	0.03%	clear	9/22/08	0			
17		1.20%	0.03%	1"square	9/22/08	8			
18		1.20%	0.03%	1"hole	9/22/08	6			
19	Untreated	none	none	clear	9/22/08	20			
20		none	none	1"square	9/22/08	20			
21		none	none	1"hole	9/22/08	20			

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Hour One, 15 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	10			
2		0.20%	0.005%	1"square	9/22/08	2			
3		0.20%	0.005%	1"hole	9/22/08	8			
4	Preventol	0.60%	0.015%	clear	9/22/08	10			
5		0.60%	0.015%	1"square	9/22/08	8			
6		0.60%	0.015%	1"hole	9/22/08	10			
7	Preventol	1.20%	0.03%	clear	9/22/08	2			
8		1.20%	0.03%	1"square	9/22/08	2			
9		1.20%	0.03%	1"hole	9/22/08	8			
10	Diluted	0.20%	0.005%	clear	9/22/08	20			
11	Bistar	0.20%	0.005%	1"square	9/22/08	20			
12	WT	0.20%	0.005%	1"hole	9/22/08	15			
13	Diluted	0.60%	0.015%	clear	9/22/08	4			
14	Bistar	0.60%	0.015%	1"square	9/22/08	4			
15	WT	0.60%	0.015%	1"hole	9/22/08	20			
16	Diluted	1.20%	0.03%	clear	9/22/08	8			
17	Bistar	1.20%	0.03%	1"square	9/22/08	20	1		
18	WT	1.20%	0.03%	1"hole	9/22/08	20			
19	Untreated	none	none	clear	9/22/08	25			
20		none	none	1"square	9/22/08	25	1		
21		none	none	1"hole	9/22/08	30	2		

Hour One, 20 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	16			
2		0.20%	0.005%	1"square	9/22/08	3	1		
3		0.20%	0.005%	1"hole	9/22/08	4			
4	Preventol	0.60%	0.015%	clear	9/22/08	12			
5		0.60%	0.015%	1"square	9/22/08	3			
6		0.60%	0.015%	1"hole	9/22/08	12			
7	Preventol	1.20%	0.03%	clear	9/22/08	8			
8		1.20%	0.03%	1"square	9/22/08	10			
9		1.20%	0.03%	1"hole	9/22/08	20			
10	Diluted	0.20%	0.005%	clear	9/22/08	40			
11	Bistar	0.20%	0.005%	1"square	9/22/08	30			
12	WT	0.20%	0.005%	1"hole	9/22/08	30			
13	Diluted	0.60%	0.015%	clear	9/22/08	20			
14	Bistar	0.60%	0.015%	1"square	9/22/08	10			
15	WT	0.60%	0.015%	1"hole	9/22/08	30	6		
16	Diluted	1.20%	0.03%	clear	9/22/08	20			
17	Bistar	1.20%	0.03%	1"square	9/22/08	30			
18	WT	1.20%	0.03%	1"hole	9/22/08	30	3		
19	Untreated	none	none	clear	9/22/08	20			
20		none	none	1"square	9/22/08	20			
21		none	none	1"hole	9/22/08	20	1		

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Hour One, 25 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	8			
2		0.20%	0.005%	1"square	9/22/08	8			
3		0.20%	0.005%	1"hole	9/22/08	12			
4	Preventol	0.60%	0.015%	clear	9/22/08	8			
5		0.60%	0.015%	1"square	9/22/08	8			
6		0.60%	0.015%	1"hole	9/22/08	12			
7	Preventol	1.20%	0.03%	clear	9/22/08	8			
8		1.20%	0.03%	1"square	9/22/08	16			
9		1.20%	0.03%	1"hole	9/22/08	16			
10	Diluted	0.20%	0.005%	clear	9/22/08	30			
11	Bistar	0.20%	0.005%	1"square	9/22/08	30			
12	WT	0.20%	0.005%	1"hole	9/22/08	30			
13	Diluted	0.60%	0.015%	clear	9/22/08	25			
14	Bistar	0.60%	0.015%	1"square	9/22/08	20			
15	WT	0.60%	0.015%	1"hole	9/22/08	40	12		
16	Diluted	1.20%	0.03%	clear	9/22/08	20			
17	Bistar	1.20%	0.03%	1"square	9/22/08	40			
18	WT	1.20%	0.03%	1"hole	9/22/08	40	5		
19	Untreated	none	none	clear	9/22/08	20			
20		none	none	1"square	9/22/08	20	1		
21		none	none	1"hole	9/22/08	20	1		

Hour One, 30 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	6			
2		0.20%	0.005%	1"square	9/22/08	4			
3		0.20%	0.005%	1"hole	9/22/08	10			
4	Preventol	0.60%	0.015%	clear	9/22/08	4			
5		0.60%	0.015%	1"square	9/22/08	5			
6		0.60%	0.015%	1"hole	9/22/08	12			
7	Preventol	1.20%	0.03%	clear	9/22/08	8			
8		1.20%	0.03%	1"square	9/22/08	15			
9		1.20%	0.03%	1"hole	9/22/08	20			
10	Diluted	0.20%	0.005%	clear	9/22/08	40			
11	Bistar	0.20%	0.005%	1"square	9/22/08	40			
12	WT	0.20%	0.005%	1"hole	9/22/08	35			
13	Diluted	0.60%	0.015%	clear	9/22/08	35			
14	Bistar	0.60%	0.015%	1"square	9/22/08	40			
15	WT	0.60%	0.015%	1"hole	9/22/08	45	10		
16	Diluted	1.20%	0.03%	clear	9/22/08	30			
17	Bistar	1.20%	0.03%	1"square	9/22/08	50	1		
18	WT	1.20%	0.03%	1"hole	9/22/08	50	1		
19	Untreated	none	none	clear	9/22/08	30			
20		none	none	1"square	9/22/08	30			
21		none	none	1"hole	9/22/08	30			

AMERICAN WOOD PROTECTION ASSOCIATION

Hour One, 35 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	6			
2		0.20%	0.005%	1"square	9/22/08	8			
3		0.20%	0.005%	1"hole	9/22/08	20			
4	Preventol	0.60%	0.015%	clear	9/22/08	5			
5		0.60%	0.015%	1"square	9/22/08	4			
6		0.60%	0.015%	1"hole	9/22/08	12	1		
7	Preventol	1.20%	0.03%	clear	9/22/08	20			
8		1.20%	0.03%	1"square	9/22/08	30			
9		1.20%	0.03%	1"hole	9/22/08	30			
10	Diluted	0.20%	0.005%	clear	9/22/08	60			
11	Bistar	0.20%	0.005%	1"square	9/22/08	60			
12	WT	0.20%	0.005%	1"hole	9/22/08	60			
13	Diluted	0.60%	0.015%	clear	9/22/08	40			
14	Bistar	0.60%	0.015%	1"square	9/22/08	50			
15	WT	0.60%	0.015%	1"hole	9/22/08	50	8		
16	Diluted	1.20%	0.03%	clear	9/22/08	60			
17	Bistar	1.20%	0.03%	1"square	9/22/08	60			
18	WT	1.20%	0.03%	1"hole	9/22/08	60	2		
19	Untreated	none	none	clear	9/22/08	30			
20		none	none	1"square	9/22/08	30	2		
21		none	none	1"hole	9/22/08	30			

Hour One, 40 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	2			
2		0.20%	0.005%	1"square	9/22/08	4			
3		0.20%	0.005%	1"hole	9/22/08	8	1		
4	Preventol	0.60%	0.015%	clear	9/22/08	12			
5		0.60%	0.015%	1"square	9/22/08	15			
6		0.60%	0.015%	1"hole	9/22/08	15			
7	Preventol	1.20%	0.03%	clear	9/22/08	25			
8		1.20%	0.03%	1"square	9/22/08	30			
9		1.20%	0.03%	1"hole	9/22/08	30			
10	Diluted	0.20%	0.005%	clear	9/22/08	60			
11	Bistar	0.20%	0.005%	1"square	9/22/08	60			
12	WT	0.20%	0.005%	1"hole	9/22/08	60			
13	Diluted	0.60%	0.015%	clear	9/22/08	50			
14	Bistar	0.60%	0.015%	1"square	9/22/08	50			
15	WT	0.60%	0.015%	1"hole	9/22/08	50	8		
16	Diluted	1.20%	0.03%	clear	9/22/08	60			
17	Bistar	1.20%	0.03%	1"square	9/22/08	60			
18	WT	1.20%	0.03%	1"hole	9/22/08	60			
19	Untreated	none	none	clear	9/22/08	30			
20		none	none	1"square	9/22/08	30			
21		none	none	1"hole	9/22/08	30			

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Hour One, 45 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	3			
2		0.20%	0.005%	1"square	9/22/08	6			
3		0.20%	0.005%	1"hole	9/22/08	10			
4	Preventol	0.60%	0.015%	clear	9/22/08	4			
5		0.60%	0.015%	1"square	9/22/08	4			
6		0.60%	0.015%	1"hole	9/22/08	12			
7	Preventol	1.20%	0.03%	clear	9/22/08	12	2		
8		1.20%	0.03%	1"square	9/22/08	20			
9		1.20%	0.03%	1"hole	9/22/08	20			
10	Diluted	0.20%	0.005%	clear	9/22/08	60			
11	Bistar	0.20%	0.005%	1"square	9/22/08	60	2		
12	WT	0.20%	0.005%	1"hole	9/22/08	60			
13	Diluted	0.60%	0.015%	clear	9/22/08	50			
14	Bistar	0.60%	0.015%	1"square	9/22/08	50			
15	WT	0.60%	0.015%	1"hole	9/22/08	50	10		
16	Diluted	1.20%	0.03%	clear	9/22/08	50	2		
17	Bistar	1.20%	0.03%	1"square	9/22/08	50	3		
18	WT	1.20%	0.03%	1"hole	9/22/08	50			
19	Untreated	none	none	clear	9/22/08	30			
20		none	none	1"square	9/22/08	30			
21		none	none	1"hole	9/22/08	30			

Hour One, 50 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	4			
2		0.20%	0.005%	1"square	9/22/08	2			
3		0.20%	0.005%	1"hole	9/22/08	12			
4	Preventol	0.60%	0.015%	clear	9/22/08	10			
5		0.60%	0.015%	1"square	9/22/08	15			
6		0.60%	0.015%	1"hole	9/22/08	15			
7	Preventol	1.20%	0.03%	clear	9/22/08	10			
8		1.20%	0.03%	1"square	9/22/08	20	3		
9		1.20%	0.03%	1"hole	9/22/08	20			
10	Diluted	0.20%	0.005%	clear	9/22/08	80			
11	Bistar	0.20%	0.005%	1"square	9/22/08	80	1		
12	WT	0.20%	0.005%	1"hole	9/22/08	80			
13	Diluted	0.60%	0.015%	clear	9/22/08	60			
14	Bistar	0.60%	0.015%	1"square	9/22/08	60			
15	WT	0.60%	0.015%	1"hole	9/22/08	80	8		
16	Diluted	1.20%	0.03%	clear	9/22/08	80			
17	Bistar	1.20%	0.03%	1"square	9/22/08	80			
18	WT	1.20%	0.03%	1"hole	9/22/08	80			
19	Untreated	none	none	clear	9/22/08	50			
20		none	none	1"square	9/22/08	50			
21		none	none	1"hole	9/22/08	50	2		

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Hour One, 55 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	4			
2		0.20%	0.005%	1"square	9/22/08	6			
3		0.20%	0.005%	1"hole	9/22/08	17			
4	Preventol	0.60%	0.015%	clear	9/22/08	10			
5		0.60%	0.015%	1"square	9/22/08	20			
6		0.60%	0.015%	1"hole	9/22/08	20			
7	Preventol	1.20%	0.03%	clear	9/22/08	0			
8		1.20%	0.03%	1"square	9/22/08	20			
9		1.20%	0.03%	1"hole	9/22/08	20			
10	Diluted	0.20%	0.005%	clear	9/22/08	80			
11	Bistar	0.20%	0.005%	1"square	9/22/08	80			
12	WT	0.20%	0.005%	1"hole	9/22/08	80			
13	Diluted	0.60%	0.015%	clear	9/22/08	80			
14	Bistar	0.60%	0.015%	1"square	9/22/08	80			
15	WT	0.60%	0.015%	1"hole	9/22/08	80	10		
16	Diluted	1.20%	0.03%	clear	9/22/08	70			
17	Bistar	1.20%	0.03%	1"square	9/22/08	70			
18	WT	1.20%	0.03%	1"hole	9/22/08	70			
19	Untreated	none	none	clear	9/22/08	50			
20		none	none	1"square	9/22/08	50			
21		none	none	1"hole	9/22/08	50			

Hour One, 60 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	2			
2		0.20%	0.005%	1"square	9/22/08	2			
3		0.20%	0.005%	1"hole	9/22/08	12			
4	Preventol	0.60%	0.015%	clear	9/22/08	2			
5		0.60%	0.015%	1"square	9/22/08	2			
6		0.60%	0.015%	1"hole	9/22/08	4			
7	Preventol	1.20%	0.03%	clear	9/22/08	4			
8		1.20%	0.03%	1"square	9/22/08	12	2		
9		1.20%	0.03%	1"hole	9/22/08	12			
10	Diluted	0.20%	0.005%	clear	9/22/08	80			
11	Bistar	0.20%	0.005%	1"square	9/22/08	80	1		
12	WT	0.20%	0.005%	1"hole	9/22/08	80			
13	Diluted	0.60%	0.015%	clear	9/22/08	70			
14	Bistar	0.60%	0.015%	1"square	9/22/08	40	10		
15	WT	0.60%	0.015%	1"hole	9/22/08	80			
16	Diluted	1.20%	0.03%	clear	9/22/08	60			
17	Bistar	1.20%	0.03%	1"square	9/22/08	60			
18	WT	1.20%	0.03%	1"hole	9/22/08	60			
19	Untreated	none	none	clear	9/22/08	50			
20		none	none	1"square	9/22/08	50			
21		none	none	1"hole	9/22/08	50			

AMERICAN WOOD PROTECTION ASSOCIATION

Day one, hour two and three; observations every 20 minutes.

Hour Two, 20 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	0			
2		0.20%	0.005%	1"square	9/22/08	2			
3		0.20%	0.005%	1"hole	9/22/08	12			
4	Preventol	0.60%	0.015%	clear	9/22/08	2	1		
5		0.60%	0.015%	1"square	9/22/08	2			
6		0.60%	0.015%	1"hole	9/22/08	12			
7	Preventol	1.20%	0.03%	clear	9/22/08	3			
8		1.20%	0.03%	1"square	9/22/08	12			
9		1.20%	0.03%	1"hole	9/22/08	12			
10	Diluted	0.20%	0.005%	clear	9/22/08	100			
11	Bistar	0.20%	0.005%	1"square	9/22/08	100			
12	WT	0.20%	0.005%	1"hole	9/22/08	100			
13	Diluted	0.60%	0.015%	clear	9/22/08	40			
14	Bistar	0.60%	0.015%	1"square	9/22/08	40			
15	WT	0.60%	0.015%	1"hole	9/22/08	60	10		
16	Diluted	1.20%	0.03%	clear	9/22/08	40			
17	Bistar	1.20%	0.03%	1"square	9/22/08	60			
18	WT	1.20%	0.03%	1"hole	9/22/08	60			
19	Untreated	none	none	clear	9/22/08	60			
20		none	none	1"square	9/22/08	60	1		
21		none	none	1"hole	9/22/08	60	3		

Hour Two, 40 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	3			
2		0.20%	0.005%	1"square	9/22/08	3			
3		0.20%	0.005%	1"hole	9/22/08	10			
4	Preventol	0.60%	0.015%	clear	9/22/08	4			
5		0.60%	0.015%	1"square	9/22/08	6			
6		0.60%	0.015%	1"hole	9/22/08	6			
7	Preventol	1.20%	0.03%	clear	9/22/08	5			
8		1.20%	0.03%	1"square	9/22/08	12			
9		1.20%	0.03%	1"hole	9/22/08	8			
10	Diluted	0.021%	0.005%	clear	9/22/08	100			
11	Bistar	0.021%	0.005%	1"square	9/22/08	100			
12	WT	0.021%	0.005%	1"hole	9/22/08	100			
13	Diluted	0.064%	0.015%	clear	9/22/08	40			
14	Bistar	0.064%	0.015%	1"square	9/22/08	60			
15	WT	0.064%	0.015%	1"hole	9/22/08	80	8		
16	Diluted	0.128%	0.03%	clear	9/22/08	20			
17	Bistar	0.128%	0.03%	1"square	9/22/08	40			
18	WT	0.128%	0.03%	1"hole	9/22/08	40	1		
19	Untreated	none	none	clear	9/22/08	50			
20		none	none	1"square	9/22/08	50	2		
21		none	none	1"hole	9/22/08	50	2		

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Hour Two, 60 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	8			
2		0.20%	0.005%	1"square	9/22/08	6			
3		0.20%	0.005%	1"hole	9/22/08	12			
4	Preventol	0.60%	0.015%	clear	9/22/08	2			
5		0.60%	0.015%	1"square	9/22/08	2			
6		0.60%	0.015%	1"hole	9/22/08	6			
7	Preventol	1.20%	0.03%	clear	9/22/08	8			
8		1.20%	0.03%	1"square	9/22/08	20			
9		1.20%	0.03%	1"hole	9/22/08	20			
10	Diluted	0.021%	0.005%	clear	9/22/08	80	1		1
11	Bistar	0.021%	0.005%	1"square	9/22/08	80			
12	WT	0.021%	0.005%	1"hole	9/22/08	80			
13	Diluted	0.064%	0.015%	clear	9/22/08	40			12
14	Bistar	0.064%	0.015%	1"square	9/22/08	50			
15	WT	0.064%	0.015%	1"hole	9/22/08	70	2		
16	Diluted	0.128%	0.03%	clear	9/22/08	20			1
17	Bistar	0.128%	0.03%	1"square	9/22/08	40			
18	WT	0.128%	0.03%	1"hole	9/22/08	40			
19	Untreated	none	none	clear	9/22/08	50			
20		none	none	1"square	9/22/08	50			
21		none	none	1"hole	9/22/08	50			

Hour Three, 20 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	6			
2		0.20%	0.005%	1"square	9/22/08	4			
3		0.20%	0.005%	1"hole	9/22/08	4			
4	Preventol	0.60%	0.015%	clear	9/22/08	5			
5		0.60%	0.015%	1"square	9/22/08	8			
6		0.60%	0.015%	1"hole	9/22/08	12			
7	Preventol	1.20%	0.03%	clear	9/22/08	2			
8		1.20%	0.03%	1"square	9/22/08	12			
9		1.20%	0.03%	1"hole	9/22/08	12			
10	Diluted	0.021%	0.005%	clear	9/22/08	80			10
11	Bistar	0.021%	0.005%	1"square	9/22/08	80			
12	WT	0.021%	0.005%	1"hole	9/22/08	80			
13	Diluted	0.064%	0.015%	clear	9/22/08	20			20
14	Bistar	0.064%	0.015%	1"square	9/22/08	40			
15	WT	0.064%	0.015%	1"hole	9/22/08	40	2		
16	Diluted	0.128%	0.03%	clear	9/22/08	20			15
17	Bistar	0.128%	0.03%	1"square	9/22/08	40			
18	WT	0.128%	0.03%	1"hole	9/22/08	40			
19	Untreated	none	none	clear	9/22/08	50			
20		none	none	1"square	9/22/08	50			
21		none	none	1"hole	9/22/08	50			

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Hour Three, 40 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	2			
2		0.20%	0.005%	1"square	9/22/08	8			
3		0.20%	0.005%	1"hole	9/22/08	6			
4	Preventol	0.60%	0.015%	clear	9/22/08	4			
5		0.60%	0.015%	1"square	9/22/08	8			
6		0.60%	0.015%	1"hole	9/22/08	8			
7	Preventol	1.20%	0.03%	clear	9/22/08	4			
8		1.20%	0.03%	1"square	9/22/08	12			
9		1.20%	0.03%	1"hole	9/22/08	15			
10	Diluted	0.021%	0.005%	clear	9/22/08	100			25
11	Bistar	0.021%	0.005%	1"square	9/22/08	100			
12	WT	0.021%	0.005%	1"hole	9/22/08	100			
13	Diluted	0.064%	0.015%	clear	9/22/08	20			30
14	Bistar	0.064%	0.015%	1"square	9/22/08	30			
15	WT	0.064%	0.015%	1"hole	9/22/08	60	10		
16	Diluted	0.128%	0.03%	clear	9/22/08	20			20
17	Bistar	0.128%	0.03%	1"square	9/22/08	60			
18	WT	0.128%	0.03%	1"hole	9/22/08	60			
19	Untreated	none	none	clear	9/22/08	60			
20		none	none	1"square	9/22/08	60			
21		none	none	1"hole	9/22/08	60			

Hour Three, 60 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	5			
2		0.20%	0.005%	1"square	9/22/08	5			
3		0.20%	0.005%	1"hole	9/22/08	12			
4	Preventol	0.60%	0.015%	clear	9/22/08	2			
5		0.60%	0.015%	1"square	9/22/08	2			
6		0.60%	0.015%	1"hole	9/22/08	6		1	
7	Preventol	1.20%	0.03%	clear	9/22/08	12		5	
8		1.20%	0.03%	1"square	9/22/08	20			
9		1.20%	0.03%	1"hole	9/22/08	6			
10	Diluted	0.021%	0.005%	clear	9/22/08	80			45
11	Bistar	0.021%	0.005%	1"square	9/22/08	80			
12	WT	0.021%	0.005%	1"hole	9/22/08	80			
13	Diluted	0.064%	0.015%	clear	9/22/08	12			60
14	Bistar	0.064%	0.015%	1"square	9/22/08	15			
15	WT	0.064%	0.015%	1"hole	9/22/08	30	2		
16	Diluted	0.128%	0.03%	clear	9/22/08	2			65
17	Bistar	0.128%	0.03%	1"square	9/22/08	20			
18	WT	0.128%	0.03%	1"hole	9/22/08	20			
19	Untreated	none	none	clear	9/22/08	50			
20		none	none	1"square	9/22/08	50			
21		none	none	1"hole	9/22/08	50			

AMERICAN WOOD PROTECTION ASSOCIATION

Day one, hour four, five, six, seven, eight; observations every hour.

Hour Four, 60 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	6			
2		0.20%	0.005%	1"square	9/22/08	2			
3		0.20%	0.005%	1"hole	9/22/08	2			
4	Preventol	0.60%	0.015%	clear	9/22/08	3			
5		0.60%	0.015%	1"square	9/22/08	6			
6		0.60%	0.015%	1"hole	9/22/08	12			
7	Preventol	1.20%	0.03%	clear	9/22/08	3			
8		1.20%	0.03%	1"square	9/22/08	12		4	
9		1.20%	0.03%	1"hole	9/22/08	15			
10	Diluted	0.20%	0.005%	clear	9/22/08	40			100
11	Bistar	0.20%	0.005%	1"square	9/22/08	40			
12	WT	0.20%	0.005%	1"hole	9/22/08	40			
13	Diluted	0.60%	0.015%	clear	9/22/08	4			70
14	Bistar	0.60%	0.015%	1"square	9/22/08	8			
15	WT	0.60%	0.015%	1"hole	9/22/08	12	3	2	
16	Diluted	1.20%	0.03%	clear	9/22/08	1			80
17	Bistar	1.20%	0.03%	1"square	9/22/08	2			
18	WT	1.20%	0.03%	1"hole	9/22/08	6			
19	Untreated	none	none	clear	9/22/08	40			
20		none	none	1"square	9/22/08	40			
21		none	none	1"hole	9/22/08	40	6		

Hour Five, 60 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	6			
2		0.20%	0.005%	1"square	9/22/08	2			
3		0.20%	0.005%	1"hole	9/22/08	10			
4	Preventol	0.60%	0.015%	clear	9/22/08	2			
5		0.60%	0.015%	1"square	9/22/08	4			
6		0.60%	0.015%	1"hole	9/22/08	8			
7	Preventol	1.20%	0.03%	clear	9/22/08	3			20
8		1.20%	0.03%	1"square	9/22/08	8			
9		1.20%	0.03%	1"hole	9/22/08	12		3	
10	Diluted	0.20%	0.005%	clear	9/22/08	25			120
11	Bistar	0.20%	0.005%	1"square	9/22/08	30			
12	WT	0.20%	0.005%	1"hole	9/22/08	30			
13	Diluted	0.60%	0.015%	clear	9/22/08	4			100
14	Bistar	0.60%	0.015%	1"square	9/22/08	10			
15	WT	0.60%	0.015%	1"hole	9/22/08	12	4	3	
16	Diluted	1.20%	0.03%	clear	9/22/08	6			100
17	Bistar	1.20%	0.03%	1"square	9/22/08	1			
18	WT	1.20%	0.03%	1"hole	9/22/08	6			
19	Untreated	none	none	clear	9/22/08	40			
20		none	none	1"square	9/22/08	40			
21		none	none	1"hole	9/22/08	40			

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Hour Six, 60 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	2			4
2		0.20%	0.005%	1"square	9/22/08	4			
3		0.20%	0.005%	1"hole	9/22/08	12			
4	Preventol	0.60%	0.015%	clear	9/22/08	3			1
5		0.60%	0.015%	1"square	9/22/08	6			
6		0.60%	0.015%	1"hole	9/22/08	12	1		
7	Preventol	1.20%	0.03%	clear	9/22/08	0			20
8		1.20%	0.03%	1"square	9/22/08	10			
9		1.20%	0.03%	1"hole	9/22/08	20			
10	Diluted	0.20%	0.005%	clear	9/22/08	30			150
11	Bistar	0.20%	0.005%	1"square	9/22/08	30	1		
12	WT	0.20%	0.005%	1"hole	9/22/08	30			
13	Diluted	0.60%	0.015%	clear	9/22/08	2			110
14	Bistar	0.60%	0.015%	1"square	9/22/08	4			
15	WT	0.60%	0.015%	1"hole	9/22/08	15	4		
16	Diluted	1.20%	0.03%	clear	9/22/08	2			110
17	Bistar	1.20%	0.03%	1"square	9/22/08	0			
18	WT	1.20%	0.03%	1"hole	9/22/08	1			
19	Untreated	none	none	clear	9/22/08	40			
20		none	none	1"square	9/22/08	40			
21		none	none	1"hole	9/22/08	40			

Hour Seven, 60 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	4			4
2		0.20%	0.005%	1"square	9/22/08	4			
3		0.20%	0.005%	1"hole	9/22/08	12			
4	Preventol	0.60%	0.015%	clear	9/22/08	3		1	2
5		0.60%	0.015%	1"square	9/22/08	8			
6		0.60%	0.015%	1"hole	9/22/08	20			
7	Preventol	1.20%	0.03%	clear	9/22/08	3			20
8		1.20%	0.03%	1"square	9/22/08	10			
9		1.20%	0.03%	1"hole	9/22/08	12			
10	Diluted	0.20%	0.005%	clear	9/22/08	6			175
11	Bistar	0.20%	0.005%	1"square	9/22/08	10		2	
12	WT	0.20%	0.005%	1"hole	9/22/08	25		2	
13	Diluted	0.60%	0.015%	clear	9/22/08	3			110
14	Bistar	0.60%	0.015%	1"square	9/22/08	5			
15	WT	0.60%	0.015%	1"hole	9/22/08	12		3	
16	Diluted	1.20%	0.03%	clear	9/22/08	6			110
17	Bistar	1.20%	0.03%	1"square	9/22/08	4			
18	WT	1.20%	0.03%	1"hole	9/22/08	3			
19	Untreated	none	none	clear	9/22/08	50			
20		none	none	1"square	9/22/08	50			
21		none	none	1"hole	9/22/08	50	5		

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Hour Eight, 60 minutes									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/22/08	1			4
2		0.20%	0.005%	1"square	9/22/08	1			
3		0.20%	0.005%	1"hole	9/22/08	4			
4	Preventol	0.60%	0.015%	clear	9/22/08	5			2
5		0.60%	0.015%	1"square	9/22/08	2			
6		0.60%	0.015%	1"hole	9/22/08	10			
7	Preventol	1.20%	0.03%	clear	9/22/08	3			20
8		1.20%	0.03%	1"square	9/22/08	8			
9		1.20%	0.03%	1"hole	9/22/08	9			
10	Diluted	0.20%	0.005%	clear	9/22/08	25			200
11	Bistar	0.20%	0.005%	1"square	9/22/08	10		2	
12	WT	0.20%	0.005%	1"hole	9/22/08	30			
13	Diluted	0.60%	0.015%	clear	9/22/08	4			120
14	Bistar	0.60%	0.015%	1"square	9/22/08	2			
15	WT	0.60%	0.015%	1"hole	9/22/08	4	4	1	
16	Diluted	1.20%	0.03%	clear	9/22/08	3		1	115
17	Bistar	1.20%	0.03%	1"square	9/22/08	1			
18	WT	1.20%	0.03%	1"hole	9/22/08	2			
19	Untreated	none	none	clear	9/22/08	50			
20		none	none	1"square	9/22/08	50			
21		none	none	1"hole	9/22/08	60	3		

Preventol - most termites in sand or under sill plate, low mortality

Bistar - most termites on sand not under sill plate, high mortality

Controls - under sand and sill, on sand, on towers, very low mortality

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Day two; observations every hour.

Day two, 1st hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/23/08	2			4
2		0.20%	0.005%	1"square	9/23/08	1			
3		0.20%	0.005%	1"hole	9/23/08	6			
4	Preventol	0.60%	0.015%	clear	9/23/08	1		1	6
5		0.60%	0.015%	1"square	9/23/08	2			
6		0.60%	0.015%	1"hole	9/23/08	7		3	
7	Preventol	1.20%	0.03%	clear	9/23/08	0			15
8		1.20%	0.03%	1"square	9/23/08	3			
9		1.20%	0.03%	1"hole	9/23/08	12			
10	Diluted	0.20%	0.005%	clear	9/23/08	7		1	200
11	Bistar	0.20%	0.005%	1"square	9/23/08	2		2	
12	WT	0.20%	0.005%	1"hole	9/23/08	4			
13	Diluted	0.60%	0.015%	clear	9/23/08	7			110
14	Bistar	0.60%	0.015%	1"square	9/23/08	5			
15	WT	0.60%	0.015%	1"hole	9/23/08	5			
16	Diluted	1.20%	0.03%	clear	9/23/08	3			110
17	Bistar	1.20%	0.03%	1"square	9/23/08	4			
18	WT	1.20%	0.03%	1"hole	9/23/08	4			
19	Untreated	none	none	clear	9/23/08	20		5	30
20		none	none	1"square	9/23/08	21		3	
21		none	none	1"hole	9/23/08	25		8	

Day two, 2nd hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/23/08	1			6
2		0.20%	0.005%	1"square	9/23/08	2	2		
3		0.20%	0.005%	1"hole	9/23/08	4			
4	Preventol	0.60%	0.015%	clear	9/23/08	1		1	6
5		0.60%	0.015%	1"square	9/23/08	0			
6		0.60%	0.015%	1"hole	9/23/08	7		1	
7	Preventol	1.20%	0.03%	clear	9/23/08	2			20
8		1.20%	0.03%	1"square	9/23/08	1		2	
9		1.20%	0.03%	1"hole	9/23/08	8			
10	Diluted	0.20%	0.005%	clear	9/23/08	3		2	220
11	Bistar	0.20%	0.005%	1"square	9/23/08	2		2	
12	WT	0.20%	0.005%	1"hole	9/23/08	4		1	
13	Diluted	0.60%	0.015%	clear	9/23/08	12			120
14	Bistar	0.60%	0.015%	1"square	9/23/08	1			
15	WT	0.60%	0.015%	1"hole	9/23/08	16			
16	Diluted	1.20%	0.03%	clear	9/23/08	10			120
17	Bistar	1.20%	0.03%	1"square	9/23/08	3			
18	WT	1.20%	0.03%	1"hole	9/23/08	9			
19	Untreated	none	none	clear	9/23/08	25		3	40
20		none	none	1"square	9/23/08	25		3	
21		none	none	1"hole	9/23/08	25		6	

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Day two, 3rd hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/23/08	1			5
2		0.20%	0.005%	1"square	9/23/08	1			
3		0.20%	0.005%	1"hole	9/23/08	7			
4	Preventol	0.60%	0.015%	clear	9/23/08	1			6
5		0.60%	0.015%	1"square	9/23/08	0			
6		0.60%	0.015%	1"hole	9/23/08	7		2	
7	Preventol	1.20%	0.03%	clear	9/23/08	0			15
8		1.20%	0.03%	1"square	9/23/08	3		1	
9		1.20%	0.03%	1"hole	9/23/08	4			
10	Diluted	0.20%	0.005%	clear	9/23/08	14		1	240
11	Bistar	0.20%	0.005%	1"square	9/23/08	0		2	
12	WT	0.20%	0.005%	1"hole	9/23/08	8		1	
13	Diluted	0.60%	0.015%	clear	9/23/08	3			170
14	Bistar	0.60%	0.015%	1"square	9/23/08	4			
15	WT	0.60%	0.015%	1"hole	9/23/08	13		3	
16	Diluted	1.20%	0.03%	clear	9/23/08	5			120
17	Bistar	1.20%	0.03%	1"square	9/23/08	6			
18	WT	1.20%	0.03%	1"hole	9/23/08	2			
19	Untreated	none	none	clear	9/23/08	20		3	88
20		none	none	1"square	9/23/08	6	1	4	
21		none	none	1"hole	9/23/08	25	1	10	

Day two, 4th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/23/08	0			5
2		0.20%	0.005%	1"square	9/23/08	0			
3		0.20%	0.005%	1"hole	9/23/08	3			
4	Preventol	0.60%	0.015%	clear	9/23/08	0			6
5		0.60%	0.015%	1"square	9/23/08	1			
6		0.60%	0.015%	1"hole	9/23/08	6		2	
7	Preventol	1.20%	0.03%	clear	9/23/08	0			15
8		1.20%	0.03%	1"square	9/23/08	5	1	1	
9		1.20%	0.03%	1"hole	9/23/08	3			
10	Diluted	0.20%	0.005%	clear	9/23/08	12		1	240
11	Bistar	0.20%	0.005%	1"square	9/23/08	11	2	2	
12	WT	0.20%	0.005%	1"hole	9/23/08	10		1	
13	Diluted	0.60%	0.015%	clear	9/23/08	5			170
14	Bistar	0.60%	0.015%	1"square	9/23/08	4			
15	WT	0.60%	0.015%	1"hole	9/23/08	4		3	
16	Diluted	1.20%	0.03%	clear	9/23/08	5			120
17	Bistar	1.20%	0.03%	1"square	9/23/08	6			
18	WT	1.20%	0.03%	1"hole	9/23/08	2			
19	Untreated	none	none	clear	9/23/08	35		3	88
20		none	none	1"square	9/23/08	8		4	
21		none	none	1"hole	9/23/08	2	1	11	

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Day two, 5th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/23/08	1			5
2		0.20%	0.005%	1"square	9/23/08	0			
3		0.20%	0.005%	1"hole	9/23/08	3			
4	Preventol	0.60%	0.015%	clear	9/23/08	0			6
5		0.60%	0.015%	1"square	9/23/08	0			
6		0.60%	0.015%	1"hole	9/23/08	7		2	
7	Preventol	1.20%	0.03%	clear	9/23/08	1			15
8		1.20%	0.03%	1"square	9/23/08	4		1	
9		1.20%	0.03%	1"hole	9/23/08	1			
10	Diluted	0.20%	0.005%	clear	9/23/08	24		1	240
11	Bistar	0.20%	0.005%	1"square	9/23/08	11		2	
12	WT	0.20%	0.005%	1"hole	9/23/08	7		1	
13	Diluted	0.60%	0.015%	clear	9/23/08	3			170
14	Bistar	0.60%	0.015%	1"square	9/23/08	0			
15	WT	0.60%	0.015%	1"hole	9/23/08	3		3	
16	Diluted	1.20%	0.03%	clear	9/23/08	1			120
17	Bistar	1.20%	0.03%	1"square	9/23/08	1			
18	WT	1.20%	0.03%	1"hole	9/23/08	2		1	
19	Untreated	none	none	clear	9/23/08	35		3	95
20		none	none	1"square	9/23/08	6		4	
21		none	none	1"hole	9/23/08	11		11	

Day two, 6th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/23/08	1			6
2		0.20%	0.005%	1"square	9/23/08	2			
3		0.20%	0.005%	1"hole	9/23/08	2			
4	Preventol	0.60%	0.015%	clear	9/23/08	0			6
5		0.60%	0.015%	1"square	9/23/08	0			
6		0.60%	0.015%	1"hole	9/23/08	3	1	2	
7	Preventol	1.20%	0.03%	clear	9/23/08	0			18
8		1.20%	0.03%	1"square	9/23/08	2		1	
9		1.20%	0.03%	1"hole	9/23/08	1			
10	Diluted	0.20%	0.005%	clear	9/23/08	11		1	240
11	Bistar	0.20%	0.005%	1"square	9/23/08	8		2	
12	WT	0.20%	0.005%	1"hole	9/23/08	4		1	
13	Diluted	0.60%	0.015%	clear	9/23/08	2			170
14	Bistar	0.60%	0.015%	1"square	9/23/08	4			
15	WT	0.60%	0.015%	1"hole	9/23/08	1		3	
16	Diluted	1.20%	0.03%	clear	9/23/08	3			120
17	Bistar	1.20%	0.03%	1"square	9/23/08	0			
18	WT	1.20%	0.03%	1"hole	9/23/08	2		1	
19	Untreated	none	none	clear	9/23/08	30		3	95
20		none	none	1"square	9/23/08	6	2	4	
21		none	none	1"hole	9/23/08	11		11	

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Day two, 7th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/23/08	0			5
2		0.20%	0.005%	1"square	9/23/08	1			
3		0.20%	0.005%	1"hole	9/23/08	2			
4	Preventol	0.60%	0.015%	clear	9/23/08	0			6
5		0.60%	0.015%	1"square	9/23/08	0			
6		0.60%	0.015%	1"hole	9/23/08	4		2	
7	Preventol	1.20%	0.03%	clear	9/23/08	0			15
8		1.20%	0.03%	1"square	9/23/08	3		1	
9		1.20%	0.03%	1"hole	9/23/08	4			
10	Diluted	0.20%	0.005%	clear	9/23/08	10		1	240
11	Bistar	0.20%	0.005%	1"square	9/23/08	6		2	
12	WT	0.20%	0.005%	1"hole	9/23/08	10		1	
13	Diluted	0.60%	0.015%	clear	9/23/08	3			170
14	Bistar	0.60%	0.015%	1"square	9/23/08	2			
15	WT	0.60%	0.015%	1"hole	9/23/08	4		3	
16	Diluted	1.20%	0.03%	clear	9/23/08	2			120
17	Bistar	1.20%	0.03%	1"square	9/23/08	0			
18	WT	1.20%	0.03%	1"hole	9/23/08	4		1	
19	Untreated	none	none	clear	9/23/08	25		1	95
20		none	none	1"square	9/23/08	11	1	2	
21		none	none	1"hole	9/23/08	10		11	

Day two, 8th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/23/08	0			5
2		0.20%	0.005%	1"square	9/23/08	2			
3		0.20%	0.005%	1"hole	9/23/08	4			
4	Preventol	0.60%	0.015%	clear	9/23/08	0			6
5		0.60%	0.015%	1"square	9/23/08	0			
6		0.60%	0.015%	1"hole	9/23/08	3		3	
7	Preventol	1.20%	0.03%	clear	9/23/08	0			15
8		1.20%	0.03%	1"square	9/23/08	2		1	
9		1.20%	0.03%	1"hole	9/23/08	2			
10	Diluted	0.20%	0.005%	clear	9/23/08	11			244
11	Bistar	0.20%	0.005%	1"square	9/23/08	8		2	
12	WT	0.20%	0.005%	1"hole	9/23/08	4			
13	Diluted	0.60%	0.015%	clear	9/23/08	4			171
14	Bistar	0.60%	0.015%	1"square	9/23/08	2			
15	WT	0.60%	0.015%	1"hole	9/23/08	0		3	
16	Diluted	1.20%	0.03%	clear	9/23/08	4			122
17	Bistar	1.20%	0.03%	1"square	9/23/08	2			
18	WT	1.20%	0.03%	1"hole	9/23/08	2		1	
19	Untreated	none	none	clear	9/23/08	25		1	95
20		none	none	1"square	9/23/08	7		4	
21		none	none	1"hole	9/23/08	8		11	

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Day three; observations every hour.

Day three, 1st hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/24/08	1			5
2		0.20%	0.005%	1"square	9/24/08	1			
3		0.20%	0.005%	1"hole	9/24/08	0			
4	Preventol	0.60%	0.015%	clear	9/24/08	0			6
5		0.60%	0.015%	1"square	9/24/08	0			
6		0.60%	0.015%	1"hole	9/24/08	1		2	
7	Preventol	1.20%	0.03%	clear	9/24/08	0			20
8		1.20%	0.03%	1"square	9/24/08	0		1	
9		1.20%	0.03%	1"hole	9/24/08	0			
10	Diluted	0.20%	0.005%	clear	9/24/08	2		1	250
11	Bistar	0.20%	0.005%	1"square	9/24/08	0		2	
12	WT	0.20%	0.005%	1"hole	9/24/08	1		1	
13	Diluted	0.60%	0.015%	clear	9/24/08	1		1	176
14	Bistar	0.60%	0.015%	1"square	9/24/08	5		0	
15	WT	0.60%	0.015%	1"hole	9/24/08	3		3	
16	Diluted	1.20%	0.03%	clear	9/24/08	0		0	127
17	Bistar	1.20%	0.03%	1"square	9/24/08	0			
18	WT	1.20%	0.03%	1"hole	9/24/08	2			
19	Untreated	none	none	clear	9/24/08	7		2	97
20		none	none	1"square	9/24/08	4	1	3	
21		none	none	1"hole	9/24/08	5		7	

Day three, 2nd hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/24/08	0			5
2		0.20%	0.005%	1"square	9/24/08	1			
3		0.20%	0.005%	1"hole	9/24/08	0			
4	Preventol	0.60%	0.015%	clear	9/24/08	1			6
5		0.60%	0.015%	1"square	9/24/08	0			
6		0.60%	0.015%	1"hole	9/24/08	0		2	
7	Preventol	1.20%	0.03%	clear	9/24/08	0			20
8		1.20%	0.03%	1"square	9/24/08	0		1	
9		1.20%	0.03%	1"hole	9/24/08	0			
10	Diluted	0.20%	0.005%	clear	9/24/08	4			250
11	Bistar	0.20%	0.005%	1"square	9/24/08	2		2	
12	WT	0.20%	0.005%	1"hole	9/24/08	0		1	
13	Diluted	0.60%	0.015%	clear	9/24/08	3		1	176
14	Bistar	0.60%	0.015%	1"square	9/24/08	4			
15	WT	0.60%	0.015%	1"hole	9/24/08	3		3	
16	Diluted	1.20%	0.03%	clear	9/24/08	1			127
17	Bistar	1.20%	0.03%	1"square	9/24/08	3			
18	WT	1.20%	0.03%	1"hole	9/24/08	3			
19	Untreated	none	none	clear	9/24/08	10		2	97
20		none	none	1"square	9/24/08	1		3	
21		none	none	1"hole	9/24/08	4		7	

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Day three, 3rd hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/24/08	0			5
2		0.20%	0.005%	1"square	9/24/08	0			
3		0.20%	0.005%	1"hole	9/24/08	1			
4	Preventol	0.60%	0.015%	clear	9/24/08	0			6
5		0.60%	0.015%	1"square	9/24/08	0			
6		0.60%	0.015%	1"hole	9/24/08	0		1	
7	Preventol	1.20%	0.03%	clear	9/24/08	0			20
8		1.20%	0.03%	1"square	9/24/08	0			
9		1.20%	0.03%	1"hole	9/24/08	2			
10	Diluted	0.20%	0.005%	clear	9/24/08	2			250
11	Bistar	0.20%	0.005%	1"square	9/24/08	0		1	
12	WT	0.20%	0.005%	1"hole	9/24/08	3			
13	Diluted	0.60%	0.015%	clear	9/24/08	1		1	180
14	Bistar	0.60%	0.015%	1"square	9/24/08	2		1	
15	WT	0.60%	0.015%	1"hole	9/24/08	1			
16	Diluted	1.20%	0.03%	clear	9/24/08	1			130
17	Bistar	1.20%	0.03%	1"square	9/24/08	0			
18	WT	1.20%	0.03%	1"hole	9/24/08	1			
19	Untreated	none	none	clear	9/24/08	9		3	100
20		none	none	1"square	9/24/08	1		2	
21		none	none	1"hole	9/24/08	5		2	

Day three, 4th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/24/08	0			5
2		0.20%	0.005%	1"square	9/24/08	0			
3		0.20%	0.005%	1"hole	9/24/08	1			
4	Preventol	0.60%	0.015%	clear	9/24/08	0			6
5		0.60%	0.015%	1"square	9/24/08	1			
6		0.60%	0.015%	1"hole	9/24/08	0			
7	Preventol	1.20%	0.03%	clear	9/24/08	0			20
8		1.20%	0.03%	1"square	9/24/08	1			
9		1.20%	0.03%	1"hole	9/24/08	2			
10	Diluted	0.20%	0.005%	clear	9/24/08	0			250
11	Bistar	0.20%	0.005%	1"square	9/24/08	0		1	
12	WT	0.20%	0.005%	1"hole	9/24/08	2			
13	Diluted	0.60%	0.015%	clear	9/24/08	0		1	180
14	Bistar	0.60%	0.015%	1"square	9/24/08	1			
15	WT	0.60%	0.015%	1"hole	9/24/08	2			
16	Diluted	1.20%	0.03%	clear	9/24/08	0			130
17	Bistar	1.20%	0.03%	1"square	9/24/08	2			
18	WT	1.20%	0.03%	1"hole	9/24/08	3			
19	Untreated	none	none	clear	9/24/08	9		3	100
20		none	none	1"square	9/24/08	2		3	
21		none	none	1"hole	9/24/08	5		3	

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Day three, 5th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/24/08	0			6
2		0.20%	0.005%	1"square	9/24/08	0			
3		0.20%	0.005%	1"hole	9/24/08	1			
4	Preventol	0.60%	0.015%	clear	9/24/08	0			5
5		0.60%	0.015%	1"square	9/24/08	0			
6		0.60%	0.015%	1"hole	9/24/08	2			
7	Preventol	1.20%	0.03%	clear	9/24/08	1			22
8		1.20%	0.03%	1"square	9/24/08	1			
9		1.20%	0.03%	1"hole	9/24/08	3			
10	Diluted	0.20%	0.005%	clear	9/24/08	4			250
11	Bistar	0.20%	0.005%	1"square	9/24/08	3			
12	WT	0.20%	0.005%	1"hole	9/24/08	6			
13	Diluted	0.60%	0.015%	clear	9/24/08	2		1	180
14	Bistar	0.60%	0.015%	1"square	9/24/08	1			
15	WT	0.60%	0.015%	1"hole	9/24/08	2			
16	Diluted	1.20%	0.03%	clear	9/24/08	0			130
17	Bistar	1.20%	0.03%	1"square	9/24/08	0			
18	WT	1.20%	0.03%	1"hole	9/24/08	0			
19	Untreated	none	none	clear	9/24/08	4		2	100
20		none	none	1"square	9/24/08	2			
21		none	none	1"hole	9/24/08	6		2	

Day three, 6th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/24/08	0			5
2		0.20%	0.005%	1"square	9/24/08	2			
3		0.20%	0.005%	1"hole	9/24/08	3			
4	Preventol	0.60%	0.015%	clear	9/24/08	1			6
5		0.60%	0.015%	1"square	9/24/08	0			
6		0.60%	0.015%	1"hole	9/24/08	6		2	
7	Preventol	1.20%	0.03%	clear	9/24/08	1			22
8		1.20%	0.03%	1"square	9/24/08	1		2	
9		1.20%	0.03%	1"hole	9/24/08	4			
10	Diluted	0.20%	0.005%	clear	9/24/08	2			250
11	Bistar	0.20%	0.005%	1"square	9/24/08	5		2	
12	WT	0.20%	0.005%	1"hole	9/24/08	6		2	
13	Diluted	0.60%	0.015%	clear	9/24/08	0		1	180
14	Bistar	0.60%	0.015%	1"square	9/24/08	1			
15	WT	0.60%	0.015%	1"hole	9/24/08	5		3	
16	Diluted	1.20%	0.03%	clear	9/24/08	4			130
17	Bistar	1.20%	0.03%	1"square	9/24/08	1			
18	WT	1.20%	0.03%	1"hole	9/24/08	1			
19	Untreated	none	none	clear	9/24/08	8		2	100
20		none	none	1"square	9/24/08	8		3	
21		none	none	1"hole	9/24/08	20		7	

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Day three, 7th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/24/08	1			5
2		0.20%	0.005%	1"square	9/24/08	0			
3		0.20%	0.005%	1"hole	9/24/08	2			
4	Preventol	0.60%	0.015%	clear	9/24/08	0			6
5		0.60%	0.015%	1"square	9/24/08	1			
6		0.60%	0.015%	1"hole	9/24/08	5	1	2	
7	Preventol	1.20%	0.03%	clear	9/24/08	1			25
8		1.20%	0.03%	1"square	9/24/08	1		2	
9		1.20%	0.03%	1"hole	9/24/08	1	2		
10	Diluted	0.20%	0.005%	clear	9/24/08	2			250
11	Bistar	0.20%	0.005%	1"square	9/24/08	3		2	
12	WT	0.20%	0.005%	1"hole	9/24/08	4		2	
13	Diluted	0.60%	0.015%	clear	9/24/08	5		1	180
14	Bistar	0.60%	0.015%	1"square	9/24/08	1			
15	WT	0.60%	0.015%	1"hole	9/24/08	2		3	
16	Diluted	1.20%	0.03%	clear	9/24/08	4			130
17	Bistar	1.20%	0.03%	1"square	9/24/08	1			
18	WT	1.20%	0.03%	1"hole	9/24/08	1			
19	Untreated	none	none	clear	9/24/08	10		2	100
20		none	none	1"square	9/24/08	2		3	
21		none	none	1"hole	9/24/08	15		7	

Day three, 8th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/24/08	0			5
2		0.20%	0.005%	1"square	9/24/08	0			
3		0.20%	0.005%	1"hole	9/24/08	0			
4	Preventol	0.60%	0.015%	clear	9/24/08	0			6
5		0.60%	0.015%	1"square	9/24/08	2			
6		0.60%	0.015%	1"hole	9/24/08	3		2	
7	Preventol	1.20%	0.03%	clear	9/24/08	1			25
8		1.20%	0.03%	1"square	9/24/08	1		2	
9		1.20%	0.03%	1"hole	9/24/08	0			
10	Diluted	0.20%	0.005%	clear	9/24/08	3			250
11	Bistar	0.20%	0.005%	1"square	9/24/08	2		2	
12	WT	0.20%	0.005%	1"hole	9/24/08	2		2	
13	Diluted	0.60%	0.015%	clear	9/24/08	4		1	180
14	Bistar	0.60%	0.015%	1"square	9/24/08	1	1		
15	WT	0.60%	0.015%	1"hole	9/24/08	3		3	
16	Diluted	1.20%	0.03%	clear	9/24/08	1			130
17	Bistar	1.20%	0.03%	1"square	9/24/08	2			
18	WT	1.20%	0.03%	1"hole	9/24/08	1			
19	Untreated	none	none	clear	9/24/08	7		2	100
20		none	none	1"square	9/24/08	5		3	
21		none	none	1"hole	9/24/08	8		8	

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Day four; observations every hour.

Day four, 1st hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/25/08	0			5
2		0.20%	0.005%	1"square	9/25/08	6			
3		0.20%	0.005%	1"hole	9/25/08	2			
4	Preventol	0.60%	0.015%	clear	9/25/08	0			6
5		0.60%	0.015%	1"square	9/25/08	2			
6		0.60%	0.015%	1"hole	9/25/08	4		2	
7	Preventol	1.20%	0.03%	clear	9/25/08	1			25
8		1.20%	0.03%	1"square	9/25/08	2		1	
9		1.20%	0.03%	1"hole	9/25/08	7	3		
10	Diluted	0.20%	0.005%	clear	9/25/08	1			251
11	Bistar	0.20%	0.005%	1"square	9/25/08	4		2	
12	WT	0.20%	0.005%	1"hole	9/25/08	1		3	
13	Diluted	0.60%	0.015%	clear	9/25/08	3		1	182
14	Bistar	0.60%	0.015%	1"square	9/25/08	1			
15	WT	0.60%	0.015%	1"hole	9/25/08	1		3	
16	Diluted	1.20%	0.03%	clear	9/25/08	2			131
17	Bistar	1.20%	0.03%	1"square	9/25/08	1			
18	WT	1.20%	0.03%	1"hole	9/25/08	0			
19	Untreated	none	none	clear	9/25/08	4			100
20		none	none	1"square	9/25/08	5		2	
21		none	none	1"hole	9/25/08	7	1	6	

Day four, 2nd hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/25/08	1			5
2		0.20%	0.005%	1"square	9/25/08	2			
3		0.20%	0.005%	1"hole	9/25/08	4			
4	Preventol	0.60%	0.015%	clear	9/25/08	0			6
5		0.60%	0.015%	1"square	9/25/08	1			
6		0.60%	0.015%	1"hole	9/25/08	6		2	
7	Preventol	1.20%	0.03%	clear	9/25/08	2			25
8		1.20%	0.03%	1"square	9/25/08	1		1	
9		1.20%	0.03%	1"hole	9/25/08	22			
10	Diluted	0.20%	0.005%	clear	9/25/08	1			251
11	Bistar	0.20%	0.005%	1"square	9/25/08	2		2	
12	WT	0.20%	0.005%	1"hole	9/25/08	3		3	
13	Diluted	0.60%	0.015%	clear	9/25/08	6		1	182
14	Bistar	0.60%	0.015%	1"square	9/25/08	2			
15	WT	0.60%	0.015%	1"hole	9/25/08	2		3	
16	Diluted	1.20%	0.03%	clear	9/25/08	1			131
17	Bistar	1.20%	0.03%	1"square	9/25/08	2			
18	WT	1.20%	0.03%	1"hole	9/25/08	5			
19	Untreated	none	none	clear	9/25/08	3			100
20		none	none	1"square	9/25/08	3		2	
21		none	none	1"hole	9/25/08	8	1	6	

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Day four, 3rd hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/25/08	1			5
2		0.20%	0.005%	1"square	9/25/08	2			
3		0.20%	0.005%	1"hole	9/25/08	4			
4	Preventol	0.60%	0.015%	clear	9/25/08	0			6
5		0.60%	0.015%	1"square	9/25/08	1			
6		0.60%	0.015%	1"hole	9/25/08	6		2	
7	Preventol	1.20%	0.03%	clear	9/25/08	2			25
8		1.20%	0.03%	1"square	9/25/08	1		1	
9		1.20%	0.03%	1"hole	9/25/08	21			
10	Diluted	0.20%	0.005%	clear	9/25/08	1			251
11	Bistar	0.20%	0.005%	1"square	9/25/08	2		2	
12	WT	0.20%	0.005%	1"hole	9/25/08	3		3	
13	Diluted	0.60%	0.015%	clear	9/25/08	6		1	182
14	Bistar	0.60%	0.015%	1"square	9/25/08	2			
15	WT	0.60%	0.015%	1"hole	9/25/08	2		3	
16	Diluted	1.20%	0.03%	clear	9/25/08	1			131
17	Bistar	1.20%	0.03%	1"square	9/25/08	2			
18	WT	1.20%	0.03%	1"hole	9/25/08	5			
19	Untreated	none	none	clear	9/25/08	3			100
20		none	none	1"square	9/25/08	4		2	
21		none	none	1"hole	9/25/08	9	1	6	

Day four, 4th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/25/08	1			5
2		0.20%	0.005%	1"square	9/25/08	2			
3		0.20%	0.005%	1"hole	9/25/08	3			
4	Preventol	0.60%	0.015%	clear	9/25/08	0			6
5		0.60%	0.015%	1"square	9/25/08	1			
6		0.60%	0.015%	1"hole	9/25/08	5		2	
7	Preventol	1.20%	0.03%	clear	9/25/08	2			25
8		1.20%	0.03%	1"square	9/25/08	1		1	
9		1.20%	0.03%	1"hole	9/25/08	21			
10	Diluted	0.20%	0.005%	clear	9/25/08	1			251
11	Bistar	0.20%	0.005%	1"square	9/25/08	3		2	
12	WT	0.20%	0.005%	1"hole	9/25/08	2		3	
13	Diluted	0.60%	0.015%	clear	9/25/08	5		1	182
14	Bistar	0.60%	0.015%	1"square	9/25/08	2			
15	WT	0.60%	0.015%	1"hole	9/25/08	2		3	
16	Diluted	1.20%	0.03%	clear	9/25/08	1			131
17	Bistar	1.20%	0.03%	1"square	9/25/08	2			
18	WT	1.20%	0.03%	1"hole	9/25/08	6			
19	Untreated	none	none	clear	9/25/08	3			100
20		none	none	1"square	9/25/08	5		2	
21		none	none	1"hole	9/25/08	9		6	

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Day four, 5th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/25/08	1			5
2		0.20%	0.005%	1"square	9/25/08	1			
3		0.20%	0.005%	1"hole	9/25/08	2			
4	Preventol	0.60%	0.015%	clear	9/25/08	2			6
5		0.60%	0.015%	1"square	9/25/08	1			
6		0.60%	0.015%	1"hole	9/25/08	5		2	
7	Preventol	1.20%	0.03%	clear	9/25/08	1			25
8		1.20%	0.03%	1"square	9/25/08	1		1	
9		1.20%	0.03%	1"hole	9/25/08	11			
10	Diluted	0.20%	0.005%	clear	9/25/08	3			251
11	Bistar	0.20%	0.005%	1"square	9/25/08	2		2	
12	WT	0.20%	0.005%	1"hole	9/25/08	6		3	
13	Diluted	0.60%	0.015%	clear	9/25/08	0		1	182
14	Bistar	0.60%	0.015%	1"square	9/25/08	1			
15	WT	0.60%	0.015%	1"hole	9/25/08	1		3	
16	Diluted	1.20%	0.03%	clear	9/25/08	0			131
17	Bistar	1.20%	0.03%	1"square	9/25/08	1			
18	WT	1.20%	0.03%	1"hole	9/25/08	2			
19	Untreated	none	none	clear	9/25/08	0			100
20		none	none	1"square	9/25/08	3		2	
21		none	none	1"hole	9/25/08	1		6	

Day four, 6th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/25/08	0			5
2		0.20%	0.005%	1"square	9/25/08	1			
3		0.20%	0.005%	1"hole	9/25/08	2			
4	Preventol	0.60%	0.015%	clear	9/25/08	0			6
5		0.60%	0.015%	1"square	9/25/08	1			
6		0.60%	0.015%	1"hole	9/25/08	5		2	
7	Preventol	1.20%	0.03%	clear	9/25/08	2			25
8		1.20%	0.03%	1"square	9/25/08	1		1	
9		1.20%	0.03%	1"hole	9/25/08	11			
10	Diluted	0.20%	0.005%	clear	9/25/08	1			251
11	Bistar	0.20%	0.005%	1"square	9/25/08	4		2	
12	WT	0.20%	0.005%	1"hole	9/25/08	3		3	
13	Diluted	0.60%	0.015%	clear	9/25/08	2		1	182
14	Bistar	0.60%	0.015%	1"square	9/25/08	1			
15	WT	0.60%	0.015%	1"hole	9/25/08	2		4	
16	Diluted	1.20%	0.03%	clear	9/25/08	2			131
17	Bistar	1.20%	0.03%	1"square	9/25/08	2			
18	WT	1.20%	0.03%	1"hole	9/25/08	0			
19	Untreated	none	none	clear	9/25/08	2			100
20		none	none	1"square	9/25/08	1		2	
21		none	none	1"hole	9/25/08	2		6	

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Day four, 7th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/25/08	0			5
2		0.20%	0.005%	1"square	9/25/08	1			
3		0.20%	0.005%	1"hole	9/25/08	2			
4	Preventol	0.60%	0.015%	clear	9/25/08	1			6
5		0.60%	0.015%	1"square	9/25/08	0			
6		0.60%	0.015%	1"hole	9/25/08	8		2	
7	Preventol	1.20%	0.03%	clear	9/25/08	2			25
8		1.20%	0.03%	1"square	9/25/08	1		1	
9		1.20%	0.03%	1"hole	9/25/08	12			
10	Diluted	0.20%	0.005%	clear	9/25/08	2			251
11	Bistar	0.20%	0.005%	1"square	9/25/08	1		2	
12	WT	0.20%	0.005%	1"hole	9/25/08	3		3	
13	Diluted	0.60%	0.015%	clear	9/25/08	0		1	182
14	Bistar	0.60%	0.015%	1"square	9/25/08	0			
15	WT	0.60%	0.015%	1"hole	9/25/08	0		4	
16	Diluted	1.20%	0.03%	clear	9/25/08	1			131
17	Bistar	1.20%	0.03%	1"square	9/25/08	1			
18	WT	1.20%	0.03%	1"hole	9/25/08	1			
19	Untreated	none	none	clear	9/25/08	4			100
20		none	none	1"square	9/25/08	2		2	
21		none	none	1"hole	9/25/08	0		6	

Day four, 8th hour									
ID	Treatment	Concentrate	a.i.	Condition	Date	# on tower	hole/ square	mortality	mort. Sill
1	Preventol	0.20%	0.005%	clear	9/25/08	0			5
2		0.20%	0.005%	1"square	9/25/08	1			
3		0.20%	0.005%	1"hole	9/25/08	1			
4	Preventol	0.60%	0.015%	clear	9/25/08	0			6
5		0.60%	0.015%	1"square	9/25/08	1			
6		0.60%	0.015%	1"hole	9/25/08	6		2	
7	Preventol	1.20%	0.03%	clear	9/25/08	1			25
8		1.20%	0.03%	1"square	9/25/08	1		1	
9		1.20%	0.03%	1"hole	9/25/08	15			
10	Diluted	0.20%	0.005%	clear	9/25/08	0			251
11	Bistar	0.20%	0.005%	1"square	9/25/08	0		1	
12	WT	0.20%	0.005%	1"hole	9/25/08	1		4	
13	Diluted	0.60%	0.015%	clear	9/25/08	0		1	182
14	Bistar	0.60%	0.015%	1"square	9/25/08	0			
15	WT	0.60%	0.015%	1"hole	9/25/08	3		4	
16	Diluted	1.20%	0.03%	clear	9/25/08	3			131
17	Bistar	1.20%	0.03%	1"square	9/25/08	1			
18	WT	1.20%	0.03%	1"hole	9/25/08	0			
19	Untreated	none	none	clear	9/25/08	4			100
20		none	none	1"square	9/25/08	2		2	
21		none	none	1"hole	9/25/08	2		6	