EFFICACY REVIEW

DATE: IN 8/28/87 OUT 9/16/87

FILE OR REG. NO. 1624-39

PETITION OR EXP. PERMIT NO.

DATE DIV. RECEIVED 5/13/87

DATE OF SUBMISSION 4/16/87

DATE SUBMISSION ACCEPTED

TYPE PRODUCT(S): I, D, H, (F,) N, R, S

DATA ACCESSION NO(S).

PRODUCT MGR. NO. 21

PRODUCT NAME(S) Tim-Bor

COMPANY NAME U.S. Borax & Chemical Corp.

SUBMISSION PURPOSE revised label (add termite control and advise directions)

CHEMICAL & FORMULATION Disodium Octaborate tetrahydrate, 98% powder (boron equiv = 20.5%)

CONCLUSIONS & RECOMMENDATIONS Concur with comments from TSS, IRB.

C. Sauble
TSS, FNB
RD (TS-767C) E 9/16/87

TECHNICAL SUPPORT SECTION PRODUCT PERFORMANCE REVIEW

PM: 21 08-04-87

001624-00039
Tim-Bor
U.S. Borax & Chemical Corp.
Los Angeles CA 90010

IN: 06-17-87
DUE:
AC: 315
RN: 197660
MRID: 401965-01 thru
COM: RL 22

FORMULATION

Borax.....98.000%

INTRODUCTION

Application for amended registration, data to support label claims regarding the control of termites in wood not in contact with the ground. Label presently bears claims for wood-boring insects with the exception of termites.

USES

All species of subterranean, damp wood, dry wood, and formosan termites. Application as follows:

1. Dip-diffusion. 1.8-2.8 pounds per gallon of water at 120-135 degrees F held for 2-8 weeks. See label chart for treatment according to lumber thickness.

2. Vacuum Pressure, spray, and brush processes are listed but no directions for use or dosages are associated with the use patterns. Presumably the dosages and applications are those listed for remedial treatment.

3. Remedial treatment. Mix 1 pound with 1 gallon of water. (10.5% active ingredient). One gallon will cover 200 linear feet of 2X4 lumber. One gallon will treat 10 sq. ft. of soil using surface spray techniques. Use 4 gallons per 10 linear feet for trench or drilled wall.

4. Application to infested wood. Brush-on or coarse spray to the point of run-off. Multiple applications may be necessary for lumber thicker than a 2X4. Solutions can be injected into termite galleries.

5. Crawl space treatments. Surface spray, wall void (hollow block), trenching, and rodding. Do not treat soil adjacent to the foundation or soil near growing plants.

SUBMITTED DATA

A. MRID 401965

01 and 02. Mauldin and Beal, USDA Wood Products Lab, Gulfport, MS. Results of lab and field studies. See the attached efficacy data summary.

03 & 04. Preston, McKaig, & Walcheski. Institute of Wood Research, Michigan Technical University, Houghton, MI. 1985. Results of testing in Florida and Hawaii. Results on summary sheet. Note that the 0.15% brush-on treatment failed in FL after 2 years.

05. Reirson, 1966. Drywood termites A 15 second dip (highly susceptible cedar blocks) at 5.0% gave 93% mortality (89% adj.) after 28 days.

06. Williams and Amburgey. USFS. Gulfport, MS. Banak (Brazilian) lumber dipped for 1 minute at 25-30% BAE. X-Ray evaluations for infestations of Lyctus brunneus. Excellent protection (100%) with a 65 % infestation rate in the control. For R. flavipes, good control achieved with 0.30% BAE and above.

07, 08, 09, 10, 11, all from Kofoid, 1934. Indications of boric acid toxicity.

12. Gay et al. Australian data. Data are difficult to interpret, all target species are not found in the U.S.

13. Tamblyn et al. 1959. Australian data. Eucalyptus veneer dips for various spp. Data do not apply to the proposed uses.

14. Untranslated German data.

15. Findlay, 1960. German Society for Wood Research. Summary of information from other reports. No actual data or studies included.

16. MacNulty and Wilkerson, 1958. Port Harcourt, Nigeria. Data on a drywood termite, Cryptotermes havilandi, in beech and mahogany. Data are very difficult to interpret, but do not apply well to the proposed use patterns.

17. Johnson and Howic,. Australian data.

18. Tisseverasinghe & Jayatilleke, 1975. Data from Ceylon. Drywood termite, Cryptotermes domesticus, rubber wood and etamba. Reports that very low levels kill the termite gut flora. BAE at .83 % was not effective. 1.75 % BAE gave 21 to 100 days protection. These data of little application to the proposed use patterns.

19. H. Mori, 1984. A summary of some studies for C. formosans, no actual studies or data reported.

20. Roff, J.W. 1974. Canadian Forestry Service. Packaged hemfir with diffusion dip. Termitocide evaluation hampered by the inclusion of sodium pentachlorophenate to the mixture.

21. W. V. Harris. 1961. Several summary information accounts, no actual studies or data.

22. Malouf, G.M. 1987. U.S. Borax. Wood penetration studies. 2X4 fir, 2 ft. long treated at 1 gal per 200 linear feet. no application to cut ends. 2nd application after 3 hours air dried. Cucurmin dye test for penetration. Dry wood at 9.0% moisture.

Percent	No. Applications	% BAE:	4 days	7 days
10	1		0.05	x
10	2		0.11	0.20
15	1		0.04	0.05

B. See the attached telephone memo concerning the discussion of product performance and labeling with individuals at the USDA/USFS Wood Products Laboratory, Gulfport, MS.

Termite Control o.k. for Label Uses ① Pressure Trt. ② Dip Trt (EUP data needed for Brush & Spray)

CONCLUSIONS

1. The submitted data indicate that the product will kill certain species of termites and that water/borax treatments will penetrate wood.

Pressure Treatments — O.K.

In general, it would appear that less than 0.25% BAE is inadequate to provide protection. Levels of 0.3-0.5% BAE gave acceptable protection for up to 2 years. Overall, the data support the addition of termites to the label provided that adequate information concerning the method of treatment are added to the directions for use.

O.K. Termites

Diffusion — O.K.

There was only one dip-diffusion study, and the parameters differed from those on the proposed label. Normally, we would require the submission of data indicating that the proposed method will provide adequate amounts of toxicant penetrating wood treated by the proposed directions. However, information derived from a call to Gulfport are adequate to refine the directions for use for this method of treatment.

Spray and Brush-On

The submitted data indicate that two applications of the proposed 10% dilution provided levels of only 0.2 % BAE after 7 days. While in New Zealand, this level would be completely acceptable (for the center of the treated wood), these levels have been shown to be inconsistent in the submitted data. (Note failures at 18 months in reference 02, and the failure of a single 0.15% brush-on in 03 at 2 years). It is suggested that the applicant study the applicability of 3 applications of the 10% dilution to raise the % BAE to higher levels. Additionally, field data indicating control of actual infestations of both Coptotermes and Reticulitermes are necessary prior to registration.

FOR EUP Testing

Remedial, Soil Preventative, and Crawl Space

No data were submitted.

LABELING

1. The claim for pressure treatment must be accompanied by appropriate directions for use.

2. For dip-diffusion, the 1" dosage should be modified to 1.4 lbs at e 105 degrees F. For lumber over 3 ", the label should provide a dosage of 2.5 lbs/gal at 135 degrees with 2 dips 24-72 hours apart. For all dip-diffusion treatments, the label must indicate that newly treated wood must be covered by a tarpaulin or shed roof to slow the drying process and prevent wash-off by rainfall, thus improving penetration.

3. All other claims for termite control are unacceptable. These claims and directions for use should be removed from the registered label and appear only on the experimental label until such time as acceptable data have been submitted.

4. The label must indicate that this treatment is not effective for all forms of decay and that mixing with a compatible product is recommended.

5. To page 3, under DIRECTIONS FOR USE, add 'providing the wood is not exposed to moisture or in contact with the soil' to the sentence regarding permanency, cutting, and finishing.

Phil Hutton
TSS/IRB

SUMMARY OF THE SUBMITTED DATA

REG.NO: 1624-39
COMPOUND:BORAX

NO.	SITE	PEST	REP.	TEST TYPE	% BAE	METHOD	RATING	UTC	TIME MONS.	COMMENTS
1	MS	C. FORMOSANS	10	FIELD	0.3	PRESSURE	9.1	4.5	18 MO	
2	MS	R.FLAVIPES	4	FIELD	0.2	PRESSURE	8.3	8.2	18 MO	0.5% GAVE 0.3 BAE
					0.25		9.8			
					0.5		9.9			
		C.FORMOSANS	10	LAB	0	PRESSURE			1 NO	% MORTALITY 10.7
					0.1					29.3
					0.15					60
					0.3					96.4
					0.54					99.7
3	FL	R.FLAVIPES	10	FIELD	0.03	PRESSURE	6.8	4.7	2 YR	UTC 6.7 FOR 2ND
					0.13		6.3			
					0.26		7.6			
					0.54		9			
					1.24		10			
					0.15	BRUSHON	6.6			
	HI	C.FORMOSANS	10	FIELD	0.03	PRESSURE	8.3	8		PRESSURE TO LOW FOR EVALUATION

RECORD OF COMMUNICATION	DATE: 07/08/87
TO: Phil Hutton Technical Support Section Insecticide/Rodenticide Branch Registration Division TS767C	FROM: Joe Mauldin & Lonnie Williams USFS Wood Products Lab Gulfport, MS
	TEL. NO: (601) 864-3991

SUBJECT: Product performance data and label directions for Timbor.

SUMMARY OF COMMUNICATION:

We indicated that we felt that the effective range for the product was from 0.25-0.50 % BAE, especially considering that the treated wood might eventually be exposed to C. formosans. Joe Mauldin agreed with this finding. We asked about dip diffusion instructions as we have had little experience in this area. Lonnie Williams offered the following comments relative to achieving the the desired amounts of active ingredient properly distributed throughout the treated lumber:

1. The dosage for 1 " lumber should be 1.4 lbs/gal. at 105 degrees F held for 2-4 weeks.
2. For lumber >3 " use 2.5 lbs/gal. at 135 degrees and dip twice. All dips should be for 2-5 minutes. The second dip should take place 24-72 hours after the first.
3. For all treatments, the lumber should be protected by a roof or cover to allow extra drying time for penetration and prevent runoff from rainfall. An alternative would be to restack the lumber without piling sticks.
4. The label should indicate that this product is not effective for all forms of decay and that mixing with an additional compatible product such as Busan 1009 may be necessary.

treatment to provide a margin for error in case the probe is not set in the wood most resistent to cooling by the liquid nitrogen.

UNCLEAR!

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Review Report, File Jacket