

(J3)**EVALUATION OF INSECTICIDES FOR WESTERN DRYWOOD TERMITE CONTROL, 2008****V. R. Lewis**

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Western drywood termite: *Incisitermes minor* (Hagen)

Six insecticides were tested for their effectiveness as localized treatments against *Incisitermes minor* populations contained in naturally infested boards. Candidate boards were collected from homes and decks from several cities in California. Boards were determined active for drywood termites using portable detection equipment that included termite feeding sensing devices (acoustic emission, AE) (Termite Tracker, Dunegan Engineering, Midland, TX) and X-ray (XR200, Golden Engineering, Centerville, IN). Boards with visual signs of damage were determined to be active with drywood termites by drilling a 2.4 mm dia hole and inserting the AE sensor probe roughly 8 mm deep and taking three one-min readings of termite feeding activity. This process was repeated every 45 cm down the entire length of the board. Additionally, X-ray images were taken for the entire length of each board. Three different board dimensional sizes (e.g., 2 by 4 & 2 by 6; 2 by 8 & 4 by 4; and 4 by 6 & 4 by 10) were stratified within treatment groups. Prior to treatment, all chemically treated and water only boards were drilled (2.4 mm dia) in a pattern that consisted of two diagonal holes spaced approximately 5 cm apart, down the entire length of the board for board dimensional sizes of 2 by 8 or less. For larger dimensional lumber sizes, two opposite sides of the board were drilled and treated. A State licensed structural pest control applicator conducted all drilling of holes and pesticide applications. Label instructions were followed and maximum insecticide rates were used. AIs included in laboratory tests were the following: Bora-Care® (disodium octaborate tetrahydrate (DOT) 40%, Nisus Corp., Rockford, TN), Optigard™ ZT (thiamethoxam 21.5%, Syngenta Crop Protection, Inc., Greensboro, NC), Premise Foam® (imidacloprid 0.05%, Bayer Environmental Science, Research Triangle Park, NC), Termidor SC (fipronil 9.1%, BASF Corp., Research Triangle Park, NC), Tim-bor® (DOT 98%, Nisus Corp., Rockford, TN), and XT-2000 (92% d-limonene, Xtermite, Inc., San Diego, CA and bottled by Speer, Memphis, TN). The Bora-Care was diluted with water 1:1 (20% final solution DOT). The Optigard ZT was prepared according to the label directions at a 15:1 ratio and applied with the Optigard ZT Foamer Kit. The Premise foam came as ready-to-use foam in a pressurized aerosol can equipped with an applicator tip. The Termidor SC was injected as an aqueous preparation at 0.12% final solution. The Tim-bor was mixed in water at a final 15% DOT solution. The XT-2000 was injected directly from the container into treated boards. All chemical treatments were randomized. In addition, two untreated checks were included in the study: treatments with water and no treatment. In total there were eight treatments, replicated three times. After treatment, boards were maintained in the laboratory at ambient temperature and humidity conditions for three months at the University of California Richmond Field Station. Post-treatment evaluations included dissection of all boards and counts of dead and alive termites. Data table contains treatment, board volume, number drilled holes, volume of product injected (ml) per cm³, and percentage mortality. Differences in percentage mortality among treatments were conducted using ANOVA and Tukey HSD multiple comparisons test.

Among the products used only Termidor had 100% control for all boards tested. However, boards treated with Tim-bor (99%), Bora-Care (98%), Optigard (81%), and XT-2000 (81%) also achieved considerable control and were not significantly different from Termidor. Boards treated with Premise Foam achieved significantly lesser percentage mortality results; respectively 41%. All chemically treated boards achieved significantly higher percentage mortality compared with the water only and untreated checks (averages 6% and 3%). Current findings are preliminary and additional laboratory and field studies are underway; however results thus far suggest care must be taken when considering product, application technique, and detection equipment when using localized treatments for drywood termite control.

Table 1

Treatment (Product & AI%)	Board volume cm ³ (Mean ± SE)	No. drilled holes (Mean ± SE)	Vol product injected (ml) per cm ³ (Mean ± SE)	% Mortality (Mean ± SE)
Bora-Care® (DOT 40%)	15,300± 0.54	53± 7	0.035± 0.1	98%± 0.02% ^a
Optigard™ ZT (thiamethoxam 21.6%)	14,800± 0.69	45± 4	0.011± 0.31	81%± 0.16% ^a
Premise Foam® (imidacloprid 0.05%)	16,300± 0.52	43± 9	0.01± 0.33	41%± 0.05% ^b
Termidor® SC (fipronil 9.1%)	13,400± 0.79	35± 8	0.029± 0.013	100% ^a
Tim-bor® (DOT 98%)	10,900± 0.83	29± 5	0.026± 0.18	99%± 0.1% ^a
XT-2000 (d-limonene 92%)	14,000 ± 0.69	48± 7	0.01± 0.37	81%± 6.8% ^a
Water only (100%)	14,100± 0.79	29± 3	0.027± 0.13	6%± 0.02% ^c
Untreated	16,400± 0.68	0	0	3.3%±0.02% ^c

ANOVA used of all treatment comparisons, SAS Institute Inc. Row means followed by the same letter are not significantly different P > 0.05, Tukey HSD multiple comparisons test.