

Comparing Methods to Eliminate Drywood Termites

	Vikane® fumigant	Orange oil (d-limonene, citrus oil)
Methodology	Whole-structure treatment: The entire structure is tarped and fumigated with Vikane® fumigant, killing all drywood termites inside, no matter where they are hiding.	Spot treatment: Only colonies that can be found and are accessible may be treated. Requires drilling holes into wood and injecting orange oil.
Third-party validation of efficacy	Fumigation with Vikane is the most thorough, consistent and effective treatment of infested structures in more than 20 years of university research and 55 years of commercial use. ^{1,2,3} Researchers and pest control operators acknowledge that whole-structure fumigation, compared to spot treatments, penetrates better into concealed areas, and large volumes of wood are treated more efficiently. ⁴	Laboratory research (front page) revealed that revealed that in a best case scenario with complete access to infested wood and orange oil injected at 2-inch intervals, orange oil eliminated only 81% of drywood termites. Up to hundreds of termites survived treatment. ⁵ This termite survival is important because research has shown drywood termite colonies can reproduce and increase with as few as 20 worker termites. ⁶
Treatment limits based on termite location in structure	There are no limitations: Vikane penetrates into all wood within the tarped structure to kill termites. ^{1,2}	Termite colonies must be accessible to the person performing the orange oil treatment.
Treatment limits based on applicator ability to detect termites	There are no limitations: Vikane penetrates all wood within the tarped structure to kill termites. ^{1,2}	Detecting live termites is critical for orange oil treatment: Undetected colonies will not be treated or controlled. Besides visual inspection, other detection methods for termites are infrequently used and produce uncertain results. There is always doubt as to the location and extent of drywood termites in buildings with restricted accessibility. ⁷
Possibility for damage by treatment application	The possibility of damage is low when Vikane is used according to the label. Improper tarping may cause damage.	Many injection holes in wood and walls for orange oil treatment may need to be repaired. Orange oil is an oily liquid which is used as a solvent and a degreaser. Its effect on paint and surface finishes is unknown.
Flammability	Vikane is not flammable.	Orange oil is flammable with a flashpoint of 115°F.
Indoor air quality	The licensed professional who treats a structure with Vikane must follow specific aeration procedures, including air testing using sensitive equipment to confirm federal label requirements have been met. Procedures and equipment have been extensively researched to validate their performance.	Orange oil has a pungent citrus odor. No air testing is conducted after application.
References	¹ Lewis, V.R. and M.I. Haverty. 1996. Evaluation of six techniques for control of the Western drywood termite (Isoptera: Kalotermitidae) in structures. <i>Journal of Economic Entomology</i> 89(4): 922-934. ² Scheffrahn, R.H., N.-Y. Su, and P. Busey. 1997. Laboratory and field evaluations of selected chemical treatments for control of drywood termites (Isoptera: Kalotermitidae). <i>Journal of Economic Entomology</i> 90(2): 492-502. ³ Su, N.-Y. and R.H. Scheffrahn. 1986. Field comparison of sulfuryl fluoride susceptibility among three termite species (Isoptera: Kalotermitidae, Rhinotermitidae), during structural fumigation. <i>Journal of Economic Entomology</i> 79(4): 903-908. ⁴ Lewis, V.R. 2003. IPM for Drywood Termites (Isoptera: Kalotermitidae). <i>Journal of Entomological Science</i> 38(2): 181-199. ⁵ Lewis, V. R. 2009. Unpublished research. University of California Berkeley. ⁶ Unpublished data, T. Atkinson, formerly University of California, Riverside (personal communication). ⁷ Lewis, V.R. 2002. Drywood Termites, Pest Notes, University of California Agriculture and Natural Resources. Publication 7440.	



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