

Tree Termite (*Nasutitermes costalis*) Eradication Effort

Summary Progress Report **May 14, 2003**

Introduction - An initial effort to eradicate the introduced arboreal termite, *Nasutitermes costalis* (Holmgren), was conducted on April 23, 2003 in Dania Beach, Broward County, Florida. This infestation was unprecedented. It is the first record of a non-native geographical establishment by a termite species in the family Termitidae (Scheffrahn et al. 2002). This "tree termite" feeds on wood and wood products and will consume structural elements of buildings and other wood. The infested area in Dania Beach contained many dozens of colonies with a total population count in the millions. If not controlled, this tropical termite species could eventually spread as far north as Orlando and Tampa and potentially cause millions of dollars in structural damage and potentially affect native tree species.

Because of the above ground foraging behavior of this species, conventional subterranean termite protection strategies do not target this pest. These strategies rely on creating a zone of treated soil around structures that either repel or kill termites that forage through them. The tree termite avoids these treated areas by foraging over them. The eradication effort applied insecticide to active foraging areas and nests identified during a survey of the affected area. The affected area consists of approximately 50 acres west of the Ft. Lauderdale International Airport (Figure 1).

In order to coordinate affected state and local agencies, and to provide for dissemination of accurate information to the public on research and control, the organizations working on this effort formed the Tree Termite Eradication Task Force. It consists of representatives of the Department, University of Florida Institute of Food and Agricultural Sciences (IFAS), Ft. Lauderdale Research and Education Center, Broward County Cooperative Extension Service, Certified Pest Control Operators of Florida, Florida Pest Management Association, and the Florida Fumigation Advisory Council.

The eradication effort was a cooperative venture among the organizations. The pest control associations, Florida Pest Management Association and the Certified Pest Control Operators of Florida identified a total of ten volunteers who provided equipment and time to conduct the eradication. The Fumigation Advisory Council provided fumigation for two trailers and two boats that were heavily infested. The Florida Department of Agriculture and Consumer Services provided oversight, legal authority, and supervision. The Ft. Lauderdale Research and Education Center of IFAS provided technical and outreach assistance. The Broward County Cooperative Extension Service provided outreach assistance.

Public Outreach/Education - Public education and outreach efforts were made before the application. Contact was made via personal visit or phone call with the owners of each property in the affected area. Owners of all the affected properties gave permission for the Department to conduct eradication activities on their property.

A webpage with information on the tree termite and the eradication effort (<http://www2.doacs.state.fl.us/~aes/Termite2003/>) was added to the Department's web site in early March. On March 4, 2003 a public meeting was held at the City Hall of the City of Dania Beach. The goals and methods of the eradication effort were presented and questions addressed. All the participants expressed support for the effort. Over the next week, public information packets were placed on doorknobs of approximately one hundred residences adjacent to the affected area. Media advisories and press releases were provided at appropriate times prior to and on the day of the eradication application.

Eradication Application - All treatments were performed by persons holding a Certified Operators Certificate issued under Chapter 482.111, F.S., and a valid Pest Control Identification Card. All applicators signed a Memorandum of Understanding (MOU) with the Department.

Application equipment was provided by the licensed pest control operators and consisted of hand held sprayers with an application wand, or small volume power spray equipment. Each applicator was assigned a treatment area (Figure 2).

Two insecticides were used - imidacloprid, formulated as Premise 2 and fipronil formulated as Termidor SC. Imidacloprid (Premise) was mixed at a concentration of 0.1% active ingredient. Fipronil (Termidor) was mixed at a concentration of 0.125% active ingredient. A Florida Experimental Use Permit was issued for each product, with use directions for application to the termite nests and forage areas. Five of the treatment areas received fipronil treatments, and five received imidacloprid treatments.

The insecticides used were donated to the effort by representatives of the pesticide registrants - BASF for Termidor SC, and Bayer ES for Premise 2.

A total of 380 gallons of imidacloprid application solution was mixed, using 205.5 fluid ounces (6080 ml) of Premise 2, totaling 3.211 pounds of active ingredient. A total of 450 gallons of fipronil application solution was mixed, using 702 fluid ounces (20760 ml) of Termidor SC, totaling 4.388 pounds of active ingredient. All of the material mixed was applied to the target area.

A commercial blue dye (Tracker, Lesco Corp.) was added to the application mixtures after taking tank mix samples. This dye allowed applicators visualization of treated nests and foraging areas to avoid over application or missed application.

The insecticides were applied to achieve uniform coverage at a rate of not more than 1 gallon per 10 square feet in a circular pattern over and around the nest, active tube or foraging area. In addition, the application wand was inserted into the largest opening in a nest or mound, or used to create an opening through which the wand could be inserted, and an amount equivalent to not more than 1 gallon per ten square foot applied to the interior of the mound. When nests, mounds, or tubes were within twenty-five feet of open water (two locations), application was made in such a way as to prevent any direct application of spray material to the water. Application to the nest or tube itself was done so that material did not run off of the nest or tube into water. No application was made to trees, stumps, bushes, or any other object that extended over water. Figures 3-8 show application activity.

Fumigation of infested structures and boats - In addition to the application of the imidacloprid and fipronil, two trailers and two boats were fumigated by a volunteer representing the Fumigation Advisory Council. These trailers and boats contained aerial colonies and would serve as sources for reinfestation if not controlled. The trailers were both used as offices for marinas, and the boats were in dry dock storage on wooden blocks. One trailer was located in Section 2 (Figure 2) and one trailer and two boats located in Section 7 (Figure 2). The fumigation was observed by a Department employee and was conducted in accordance with applicable regulations. Sulfuryl fluoride (Vikane), donated by Dow AgroSciences, was applied at the dry wood termite rate. Figures 9 -12 show the fumigation activity.

Sampling - Samples of water and soil were taken from fipronil and imidacloprid treatment areas before and after the application of the treatment. Samples of the formulations and the tank mix were also taken. Figures 13-15 show sampling locations and activity.

Samples were shipped or hand-delivered to the Department's Pesticide Laboratory in Tallahassee. Results will be provided in a subsequent progress report.

Effect of the Eradication Application - The effect of the eradication application will be assessed during two follow-up assessments. The first will be conducted in approximately 60 days in three sections with high levels of activity - Sections 3, 6 and 9 (see Figure 2). A more systematic and complete survey of the entire area will be conducted in the fall of 2003.

Additional Actions - The Tree Termite Eradication Task Force will conduct follow-up meetings to assess the effect of the eradication and determine what additional actions are needed.

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Pest Control Industry

Florida Pest Management Association Certified Pest Control Operators of Florida Fumigation Advisory Council		
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References

Scheffrahn, R.H., B.J. Cabrera, W.H. Kern Jr., and N.-Y. Su. 2002. *Nasutitermes costalis* (Isoptera: Termitidae) in Florida: first record of a non-endemic establishment by a higher termite. Florida Entomol. 85: 273-275.