Entom

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7. Title

Biology, Ecology, Behavior and Methods of Control of the Formosan Subterranean Termite

12. Investigator Name(s) (Last Name and Initials)

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20. Termination Date 09/30/2013	40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011

Outputs:

Active research on developing a novel treatment method (structured termite trap) has led to a provisional patent and work with the US Army Corps of Engineers to show proof of concept in protecting floodwalls, levees and spillways (Bonnet Carre Spillway). Work with vetiver grass as a extract to kill termites was of interest by the New Orleans Corps of Engineers facility as it has deep roots that help stabilize levees. Several presentations were delivered to homeowner groups to discuss areawide treatments in Baton Rouge to reduce Formosan subterranean termite pressure in their communities. A summer PCO institute and bimonthly presentations to pest control operators helped to ensure that pest control operators have the best recommendations. New treatment methodologies from chemical companies were evaluated in 2011 and included products from BASF, DuPont, Stego Industries and Sensor Development. Sensor Development has produced a "termite sniffer" based on a 2002 Patent using naphthalene as a detection trigger around termite nests and galleries. Presentations at the Annual Entomological Society of America (ESA) provided new understandings on biological control of Formosan termites as well as insights into their foraging behavior. One new termite bait toxicant was filed for patent. New developments improved the LSU AgCenter Formosan termite website on termites in trees, and increased awareness to the public and pest control industry. In additon, a significant amount of time was devoted to outreach projects that included presentations, home inspections and insect identification (including weekly calls that appear to be delusory parasitosis).

Outcomes/Impacts:

Disturbances to termite monitors and baits have often been noted as a confounding factor for the success of termite baiting systems. Studies on Formosan termite escape behavior from a food source disturbance showed that Formosan termites will abandon bait stations. Moisture content of the wood and in the environment were found to be critical to food consumption. Temperature played a vital and complementary role. Using both topical application and substrate treatments, the toxicities of newer generation soil termiticides were evaluated to determine LD50s and LC50s. One of the newest active compounds on the market, chlorantraniliprole was effective in low organic soils but ineffective in high (greater than 15 pecent) organic soils. More directed treatments included the novel structured trap treatment and Termidor Dry, a new dry formulation of fipronil provided by BASF. The structured treatment method was successful in eliminating infestations near environmentally sensitive areas such as levees and floodwalls in New Orleans, LA. This targeted process, with the dry formulation of fipronil, holds the promise of reducing environmental hazards posed by baits that are placed uniformly around structures without concern for termite activity and also eliminates using liquid termiticides that requires hundreds of gallons of mixed solution. Termidor Dry (fipronil) used around a heavily Formosan termite-infested home showed remarkable results. Although some termites were still present six months after treatment, targeted treatments need to be encouraged.

Publications:

Gautam, B. K., and G. Henderson. 2011. Effect of soil type and exposure duration on mortality and transfer of chlorantraniliprole and fipronil on Formosan subterranean termites (Isoptera: Rhinotermitidae). J. Econ. Entomol. 104: 2025-2030.

Gautam, B. K., and G. Henderson. 2011. Effects of sand moisture level on food consumption and distribution of Formosan subterranean termites (Isoptera: Rhinotermitidae) with different soldier proportions. J. Entomol. Sci. 46: 1-13.

Gautam, B. K., and G. Henderson. 2011. Escape behavior of Formosan subterranean termites (Isoptera: Rhinotermitidae) in response to disturbance. J. Insect Behav. (Published online: 30 June 2011).

Gautam, B. K., and G. Henderson. 2011. Relative humidity preference and survival of starved Formosan subterranean termites (Isoptera: Rhinotermitidae) at various temperature and relative humidity conditions. Environ. Entomol. 40:1232-1238.

Gautam, B. K., and G. Henderson. 2011. Wood consumption by Formosan subterranean termites (Isoptera: Rhinotermitidae) as affected by wood moisture content and temperature. Ann. Entomol. Soc. Am. 104: 459-464.

Mao, L., G. Henderson, and C. W. Scherer. 2011. Toxicity of seven termiticides on the Formosan and eastern subterranean termites. J. Econ. Entomol. 104: 1002-1008.

"Surviving No Swarms", compiled by Jeff Fenner based on the presentation given by G. Henderson at the 2010 University of Kentucky Short Course. Annual Termite Issue. Feb. 2011.

Participants:

Greg Henderson (PI), B. Gautam, LSU AgCenter; R. Lane, LSU A&M; Louisiana Department of Agriculture and Forestry; Louisiana Pest Management Association; Baton Rouge Pest Control Association; the Country Club of Louisiana; Sherwood Forest Homeowners association; BASF; DuPont; Stego Industries; Sensor Development; Termite Training Center; LSU/LPMA Summer Pest Control School; pest control operators.

Target Audiences:

Pest control operators needing recertification credits, homeowners needing more specific information in their community regarding termite infestations, academic colleagues finding use in my publications and individuals needing an expert to answer questions.

Project Modifications:

Nothing significant to report during this reporting period.

Approved (Signature)	Title	Date