

2016 NATIONAL CONFERENCE IN URBAN ENTOMOLOGY



PROCEEDINGS • MAY 21-24
RALEIGH-DURHAM • NORTH CAROLINA

STUDENT SCHOLARSHIP AWARD PRESENTATIONS
Blowing Rock, Tanglewood, Pinehurst

Moderator
Dan Suiter
University of Georgia

BACHELOR OF SCIENCE AWARD
SOYBEAN OIL CONSUMPTION IN RED IMPORTED FIRE ANTS,
***SOLENOPSIS INVICTA* BUREN (HYMENOPTERA: FORMICIDAE)**

Rebecca L. Baillif, Dr. Linda Hooper-Bùi, and Dr. Beverly A. Wiltz
Department of Entomology, Louisiana State University, Baton Rouge, Louisiana

MASTER OF SCIENCE AWARD
THE RESPONSE OF THE FORMOSAN SUBTERRANEAN TERMITE TO
DIFFERENT BORATE SALTS

Margaret C. Gentz and J. Kenneth Grace
Department of Plant and Environmental Protection Sciences
University of Hawai'i at Manoa, 3050 Maile Way, Gilmore Hall 310, Honolulu, HI 6822-
2231

Although boric acid and borate salts have been used since the 1800s as insecticides (Woods 1994), their mode of action is not well understood. Recent work (Lloyd 1990, Nunez 1995) indicates that effects at the cellular level are more important than mortality of intestinal fauna or the purported desiccant effects that are cited sporadically in the literature. Borate salts, in particular sodium and zinc salts, are popular and effective wood preservatives (Grace 1997), and are used extensively in Hawai'i to protect building materials from attack by both drywood (*Kalotermitidae*) and subterranean (*Rhinotermitidae*) termites (Grace 2002). The Formosan subterranean termite *Coptotermes formosanus* Shiraki is the most important pest in the state, and a threat to trees and crops in addition to causing over \$100 million in structural treatment and repair costs.

In the current study, *C. formosanus* workers were collected from field colonies maintained in Honolulu, Hawai'i, and exposed in the laboratory to composite boards containing different borate salt formulations. The treatments included zinc borate (0.88% and 0.18%), disodium octaborate tetrahydrate (DOT) (60/40 and 80/20 zinc borate/DOT formulations), anhydrous boric acid (B_2O_3) (60/40 and 80/20 zinc borate/ B_2O_3 formulations), and an untreated composite board control. Activity and mortality data were recorded over a 4-week period in order to determine whether different salt formulations elicited different responses from the termites. Results to date suggest that the concentration of boron in the wood sample, rather than the associated salt, has a greater impact on termite feeding, and that anhydrous boric acid affects termite activity more rapidly than the other formulations tested. We are continuing to assess the quantities of boron ingested and recovery rates of termites exposed to these and other borate salts.

References

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- Lloyd, J.D., D.J. Dickinson, and R.J. Murphy. 1990. The probable mechanisms of action of boric acid and borates as wood preservatives. International Research Group on Wood Preservatives. IRG/WP Document 90 - 1450. 21 pp.
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PH.D. AWARD

THE MECHANISM AND FACTORS AFFECTING HORIZONTAL TRANSFER OF FIPRONIL AMONG WESTERN SUBTERRANEAN TERMITES

Raj K. Saran and Michael K. Rust
Department of Entomology, University of California, Riverside
Riverside, CA 92521-0314

In the last 10 years, research and development have focused on the slow-acting insecticides in which mortality and speed of kill are concentration dependent (Su et al.