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Field Evaluation of Borate-treated Lumber Under Conditions of High Termite Hazard

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Introduction

Although the fungicidal properties of disodium octaborate tetrahydrate (DOT) are well established, the efficacy of this preservative against termites is still debatable. From a technical point of view, this debate is attributable to two factors: (i) some surface grazing will occur even with high DOT retentions since this compound is not immediately repellent to termites (Grace and Yamamoto 1994), and (ii) different researchers have drawn different conclusions as a result of different test conditions (Drysdale 1994, Grace et al. 1992, Preston et al. 1986, Williams et al. 1990).

Methods

Believing that the test should mirror the intended use, we designed an above-ground field test of DOT-treated dimensional lumber against the Formosan subterranean termite, *Coptotermes formosanus* Shiraki, to simulate the dodai (or sillplate) construction used in Japan. Although similar to other field tests (Grace et al. 1992, Preston et al. 1985), our design can accommodate larger samples under moisture conditions similar to those found in building construction. Our test sites in Japan and Hawaii both sustain active Formosan subterranean termite populations. Samples (10 x 10 x 40 cm, ca. 2 kg) were cut from Pacific silver fir, *Abies amabilis*, dodai pressure impregnated with DOT (TIM-BOR[®], US Borax Inc.) and categorized on the basis of solution uptake as having either a low, 1.2 percent (± 0.3) Boric Acid Equivalents, or high, 2.2 percent (± 0.4) BAE, boron content. Each sample was placed on a concrete building block 19 cm above soil grade. Feeder stakes within the block hollows extended into the soil. Sets of samples were covered with plywood (Hawaii) or plastic (Japan) boxes.

Results

Tests in Japan are in progress. In Hawaii, wood weight losses and moisture contents of the wood, concrete blocks and soil were measured after one year of field exposure. In all cases, despite relative humidity of up to

100 percent, wood moisture content was well below fiber saturation. Termites were active in all test units, with mean percentage wood weight losses of 34.7 percent (Controls), 4.5 percent (mean 1.2% BAE), and 1.2 percent (mean 2.2% BAE). This test design appears to provide a fair simulation of wood in service above ground under non-leaching conditions of high termite hazard, and we are proceeding with more extensive evaluations.

Literature cited

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