Field Testing of the Experimental Wood Preservative N’N-naphthaloylhydroxylamine: Five and eight year results

Frederick Green III
Rachel A. Arango
Stan T. Lebow
USDA Forest Products Laboratory
Madison, WI

ABSTRACT
Field trials were designed to evaluate the ability of the experimental wood preservative N’N-naphthaloylhydroxylamine (NHA) to inhibit fungal decay and termite damage at the USDA Harrison Experimental Forest in Saucier, MS. One hundred ¾” x ¾” x 18” southern yellow pine stakes and 50 ¾” x ¾” x 3” blocks were pressure treated with three concentrations of aqueous NHA (0.1%, 0.5%, & 1%), with 1% CCA used as a positive control. The smaller specimens were designed to favor termite attack by inserting the test specimen into untreated 2 x 4” feeder stakes at ground line. Feeder stakes were dismantled after 5 years and the small blocks were rated visually. Longer stakes were evaluated annually for the first five years and then every other year until the eighth year. The standard 18” NHA-treated stakes kept pace with the CCA treated stakes for the first five years and then rapidly decayed. The smaller specimens, after 5 years, showed similar results. Untreated controls and 0.1% NHA blocks failed, 1% NHA and CCA blocks were protected against termite feeding. The calcium precipitating agent NHA, has limited capacity to prevent fungal and termite damage, but the protective effect diminishes after five years in ground contact.

Keywords: CCA, NHA, subterranean termites, fungal decay, stake test

TRU-CORE Protection System for Wood

Alan S. Ross,
Kop-Coat, Inc.
Pittsburgh, PA

ABSTRACT
Wood is the most widely used building material in the United States. It has many environmentally positive characteristics including low embodied energy and sustainability. One of its few shortcomings is its relative lack of durability compared to other building materials due to its susceptibility to decay and insect attack. Chemical treatments have been used for over 100 years to improve wood’s resistance to these organisms and extend its service life, but delivering these preservatives into the wood is still largely based on 19th century technologies. The TRU-CORE Protection System is a novel, chemically-based process for rapidly delivering globally accepted wood preservatives and insecticides deep into the core of wood substrates without the use of high pressure or vacuum treating equipment or volatile organic solvents such as mineral spirits. Unlike conventional treating methods, the TRU-CORE process uses a minimal amount of water to carry the preservatives, thus eliminating the need for re-drying after treatment, which is costly and consumes energy. The TRU-CORE treatment is applied to the surface of the wood by dip or in-line spray systems. Full penetration of the preservatives is typically achieved in a 12-24 hour activation period, after which the wood can be put in service or undergo further processing steps such as painting. The TRU-CORE process is in commercial use in facilities in the United States, Australia and New Zealand where it has largely replaced an LOSP vacuum treatment which utilized large amounts of VOC-emitting petroleum-based solvents.
The Insecticide/Termiticide Imidicloprid: A Sound Choice for Sustainability

Mike H. Freeman
Independent Wood Scientist
Memphis, TN

ABSTRACT

Each year in the United States alone, the damage due to termites exceeds $11 Billion dollars. In the southern US and Hawaii, the Formosan Subterranean Termite (FST) is responsible for in excess of 2 billion dollars damage annually. This paper reviews the physical properties, chemical properties and the efficacy of one of the newer neonicotinoic insecticides, Imidicloprid and how it provides for the continued sustainability of forest products in the USA. By protecting wood from attack by wood destroying insects, the potential use for Imidicloprid saves in excess of 58 million acres of sustainable forestland resources.

Keywords: Insecticide, Termites, Imidicloprid, Sustainability, Wood-destroying Insects, and Preservative

Life Cycle Assessments of Treated Wood Products with Comparisons to Alternate Non-wood Products

Stephen T. Smith, P.E.
AquAeTer, Inc.

ABSTRACT

Life cycle assessment (LCA) provides a means to systematically assess the environmental burdens and benefits associated with the production, use, and disposal of the full life-cycle of products. AquAeTer, under contract to the Treated Wood Council, is completing six LCAs for treated wood including: ACQ-treated lumber for decking use with comparison to wood plastic composite; borate-treated lumber for wall framing with comparison to galvanized steel framing; pentachlorophenol-treated poles for utility distribution with comparison to galvanized steel and concrete poles; creosote-treated crossties for railroad use with comparison to concrete and plastic-composite ties; CCA-treated marine piling with comparison to steel, concrete, and plastic piling; and CCA-treated guard rail systems with comparison to steel guard rail systems. Cradle-to-grave life-cycle inventories (LCIs) for each product were completed for input materials and energy and output products, byproducts, wastes, and emissions. Input/output data for the wood preserving processes was determined by surveys completed by treating plant staff. Other inventory data was developed using published LCI and other production data, scientific and engineering principals, and professional judgment. LCI data was normalized to appropriate units for each product to support comparisons, such as linear feet of wall or mile of rail line and per year of use. Impact indicators, including total and fossil energy use, green-house gas emissions, acidification (acid rain), eutrophication, and water use, were calculated based on the LCI data for each product.

Generally, treated wood products offer lower life cycle impacts than the non-wood alternatives. In particular, wood products result in less GHG emissions due to their biogenic origin in which carbon is removed from the air during wood growth and in the potential to recycle products for energy recovery at the end of their use stages. Tables and graphs within each LCA report demonstrate the comparative results.