

# Increasing the durability of structures in the Southern Climatic Region when exposed to the Formosan subterranean termite

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Subterranean termites are the most commonly encountered wood-destroying pest found in structures in the United States and are reported to cause millions of dollars in damage annually. Two genera of termites, *Reticulitermes* spp. and *Coptotermes* spp., account for most of the problems encountered. Species of *Reticulitermes* are native to the United States, whereas *Coptotermes* is an introduced genus. Since its introduction into the United States in the 1950s, *Coptotermes formosanus*, more commonly known as the Formosan subterranean termite (FST), has been identified in approximately a dozen states. The majority of these states are in the southeastern portion of the United States, and the FST is becoming an increasingly greater threat to structures in the Southern Climatic Region (SCR). This pest has had significant economic impact in our neighboring state of Louisiana. It has been estimated that in the greater New Orleans area alone, the FST has caused over 3 million dollars annually in damage. This pest is becoming a growing concern in Mississippi as well. To date, 25 Mississippi counties have been found to be the home of active FST infestations. It is projected that the FST will spread northward to approximately the 35th parallel of latitude, near the border between Mississippi and Tennessee, and progress north along the eastern U. S. coast into the Carolinas. Since FST colonies are as much as ten times the size of those of our native *Reticulitermes* species, and the FST tends to be more aggressive than our native species, homes in the SCR will be at greater risk of attack by subterranean termites in the future. This is one aspect of the research program being developed by the Mississippi State University (MSU) Southern Climatic Housing Research Team, increasing the durability of homes by developing products for protecting regional homes. To conduct studies and develop procedures for protecting SCR homes from the FST, the Southern Climatic Housing Research Team, through its Department of Forest Products team members, established the Formosan Termite Research Facility (FTRF).

The FTRF consists of a laboratory and field test site to evaluate the resistance of building materials to the Formosan subterranean termite, the effectiveness of construction techniques in preventing infestation by the FST, and the efficacies of biocides to the FST. The FTRF has been established as part of MSU's housing research program in cooperation with the U.S. Forest Service Advanced Housing Research Center. MSU is a partner in the Coalition for Advanced Wood Structures. The FTRF site is located on the Mississippi State University Agricultural and Forestry Experiment Station at McNeill, MS (Pearl River County). This site was chosen because it is in a region known to be colonized by the FST. Multiple active colonies have been located on the experiment station and in nearby communities. Alates (winged forms of this pest) were captured within the field test site in the spring/summer of 2004 and 2005, indicating that mature colonies of FST are present in the area.

A laboratory for small-scale testing has been in operation at this facility since December 2004 (figure 1). Since its completion, numerous laboratory tests have been conducted by both faculty and graduate students. Graduate student research conducted in this laboratory facility was the basis for U.S. Patent #6,837,001 "Positive Directed Movement of Termites by Radio Waves as a Basis for Control Procedures," as well as the filing of other invention disclosures.

The field test area of this facility has come a long way since its inception, and work is still being done to make it more conducive to replicated studies with this organism. Seven colony sites have been established and are being monitored in the field test area. Post-beam type



test house frames constructed entirely of pressure-treated material have been erected over four of these colony sites (figure 2). These frames will be used for replicated studies of building materials.

Field testing will begin when it is determined that the transplanted colonies are sufficiently established to support meaningful research and provide valid data. Tests conducted at this facility will include, but not be limited to, field stakes, framing, siding, and panel product testing in small-scale houses, and near-ground exposure, all of which will be conducted over established FST colonies. Other testing methodologies are also being evaluated to see if accelerated field tests may be conducted using FST.

The FST is here to stay and will not be eradicated. Therefore, we must reconfigure our building practices and designs to more adequately deal with this pest and its threat to homes in the Southern Climatic Region.



Figure 1 - The laboratory at the FTRF has been in operation since the fall of 2004.



Figure 2 - Post-beam structures have been constructed over transplanted FST colonies for future testing of building materials (above). Small-scale field testing with FST is also being investigated (below).

