Concurrent Session A2 - Marker Assisted Breeding/Molecular Genetics/Physiology

Progress and Plans for Unraveling and Managing Fusiform Rust Disease

C. D. Nelson[1], T. L. Kubisiak[2], and H. V. Amerson[3]

[1]Project Leader, [2]Research Geneticist, Southern Institute of Forest Genetics, USDA Forest Service, Southern Research Station, Saucier, MS, USA; [3]Associate Professor (retired), Department of Forestry and Environmental Resources, NC State University, Raleigh, NC, USA

Fusiform rust disease continues to be the most destructive disease in southern U.S. pine plantations. Our cooperative research program is designed to identify, map, and clone the interacting genes in both the host and pathogen. Several resistance (R) genes have been identified and genetically mapped using informative families and single-spore isolate inoculations. In addition we are mapping the first of many expected corresponding genes in the pathogen. These genes condition avirulence (Avr) and are required for an incompatible (i.e., resistant) reaction to take place within an inoculated host tree that carries the

corresponding R gene. We will provide an overview of our methodology for identifying and mapping R and Avr genes, an update of our current progress, and scenarios for use of this information by tree breeders and silviculturists to identify trees with prospective R genes and to determine their value in providing resistance against the pathogen in various environments.