

**DEVELOPMENT OF MISSISSIPPI COTTON BREEDING LINES RESISTANT TO RENIFORM AND
ROOT-KNOT NEMATODES VIA MARKER ASSISTED SELECTION****Ted Wallace****Peggy Thaxton****Osman A. Gutierrez****Mississippi State University****Mississippi State, MS****Brian Scheffler****Sally Stetina****Jodi Scheffler****USDA-ARS****Stoneville, MS****Abstract**

Marker assisted selection (MAS) was used to identify plants with resistance to both root-knot (RKN) and reniform (RN) nematodes within breeding populations at the Delta Research and Extension Center (DREC) that have in their pedigrees sources of both RKN and RN resistance (Lonren derived). In 2009, 220 populations (BC1F3, F3, F4, and BC1F4) were selected based upon molecular markers, agronomic appearance, and fiber data for evaluation as observation/seed increase rows in 2010. A subset of selected populations was also grown in greenhouse containers during the winter and evaluated for RN resistance (based upon reproduction index) to confirm phenotypes (resistance) of populations derived via MAS. Most all populations phenotyped were classified as resistant when compared to susceptible check DP444BR. In addition to planting populations to observation/seed increase rows, a replicated yield trial of 68 F4 and BC1F4 populations was planted in a RN infested field at Stoneville, MS to collect yield and fiber performance data in the presence of RN nematodes. Lint yield for 22 populations produced significantly higher yields than RN resistant check Lonren. Although lint percent values were considered to be low, the wide range of fiber property values observed suggested that some populations will be useful as parental material in the development of new populations. Performance data collected from observation/seed increase rows indicated high yield potential when compared to commercial check DP393. The fuzzy green seed trait, linked to the Lonren RN nematode source of resistance, was observed in most populations. However, a number of populations possessing white linters were discovered, suggesting recombination within the Lonren RN resistance linkage group. Populations will be evaluated further in replicated yield trials, and the best populations utilized in an ongoing effort to develop nematode resistant breeding lines with competitive yields and fiber properties.