STUDYING THE NEGATIVE RELATIONSHIP BETWEEN YIELD AND FIBER QUALITY

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Abstract

An experiment was conducted to study the negative relationship between yield and fiber quality. Ten F2 and F2:3 populations were developed from crosses involving four parents with high yield/high fiber quality phenotypes and one parent with a high yield/poor fiber quality phenotype. The ten populations were developed among the five parents following a half-diallel mating design without reciprocals. The study tests the hypothesis that mating two parents with known high yield/high fiber quality phenotypes result in a greater population mean and number of offspring with high lint percent and HVI fiber quality. Pearson correlation analysis indicated that six of the ten populations maintained a negative relationship between lint percent and fiber quality while the remaining four did not. These four populations involved crosses with two Pee Dee germplasm lines, PD 2164 and PD 94042, which represent rare, recombinant lines that break the negative linkage between yield and fiber quality. These two germplasm lines can be used as breeding parents to develop offspring that overcome the negative relationship; however, their frequency is rare. Large population sizes are required to identify high yield and high fiber quality offspring.