Evaluation of Resistance to Fusiform Rust in Loblolly Pine from East Texas

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A set of 21 loblolly pine families produced by crossing trees from east Texas were tested for resistance to fusiform rust disease. The parents of these families were surviving trees in stands that experienced extensive mortality in the 1960s due to southern pine beetle infestation. Seedlings were grown in tubes in a greenhouse and artificially inoculated with *C. quercuum* from five different sources of inoculum, each consisting of single gall collections of aeciospores. Four of the collections originated from galls on loblolly pine (*C. q. fusiforme* or Cqf), whereas the remaining collection was obtained from a shortleaf pine gall (*C. q. echinatae* or Cqe). Two of the Cqf inocula were collected from trees in Louisiana, while the others were obtained from trees in east Texas. A single collection of Cqf in each state and Cqe were taken from round-shaped galls, while the other two Cqf collections were taken from typical fusiform-shaped galls.

Nine months following inoculation, seedlings were evaluated for presence/absence of rust gall(s) and gall form (gall length / gall diameter). Families showed significant differences in percent of trees galled (percent gall) by each of the Cqf inocula. No apparent relationship was observed between percent gall by the Cqe inoculum and that for any of the Cqf inocula, suggesting that different resistance genes are effective in these families for Cqf and Cqe. All galls produced by the Cqe inoculum were about round-shaped with gall form values ranging from 0.88 to 1.54. However, for the Cqf inocula no relationship was found between shape of source galls and the shape of galls formed on diseased seedlings. For example, Cqf inoculum collected from an elongated gall had an average gall form value of 1.85 compared to 2.38 for Cqf inoculum originating from a round gall. The variances observed among these families in percent gall and gall form suggests that gains in resistance to fusiform rust disease are possible within the East Texas seed source.