

GENETIC MAPPING OF RESISTANCE TO ROOT ROT DISEASE (*PHYTOPHTORA CINNAMOMI*) IN CHESTNUT (*CASTANEA SPP.*)

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A soil-born oomycete *Phytophthora cinnamomi* (Pc) causing root rot and the ascomycete fungus *Cryphonectria parasitica* (Cp) causing chestnut blight are two major pathogens of the American chestnut *Castanea dentata*. In the Southeastern forests, root rot disease has an especially severe impact on chestnut stands because of the favorable climatic and soil conditions for the *Phytophthora* life cycle. Thus, introduction of the resistance to both Pc and Cp is crucial for restoration of American chestnut in the Southeast. To address this need, a collaborative network among the American Chestnut Foundation (TACF), Clemson University (Plant Pathology) and private enterprise The Chestnut Return Farm was established for screening Cp-resistant hybrid material from the TACF breeding program for resistance to Pc. Utilizing the backcross families derived from crosses of American chestnuts with two Chinese chestnut cultivars, Mahogany and Nanking, we initiated genetic mapping and marker development for genomic region(s) underlying Pc resistance in Chinese chestnut. In pilot experiments with a limited number of progeny issued from crosses of AdairKY1 × GL158 (Nanking background) and KY115 × AD98 (Mahogany background), resistance to Pc was mapped to linkage group E (LG_E). To verify and potentially refine these results, we increased the progeny size in the KY115 × AD98 cross and incorporated three new Nanking-derived families NK1, NK2 and NK3 into our mapping efforts. Based on Pc resistance screening in 2012, 333 individuals were available for local map construction and QTL analysis. Genotyping of these individuals with 22 SSR markers spanning Chinese chestnut LG_E is currently under way. Together, these materials and these analyses should help resolve the location of the QTLs on LG_E and test their co-location between two important sources of resistance to Pc in chestnut. Results of the data analysis will be reported and discussed in this presentation.