Section 3 Abstracts: Chestnut Tree Breeding, Propagation and Physiology

Grafting and Crossing American Chestnut Trees with Blight Resistance. John Elkins,[1] Gary Griffin[2] and Lucille Griffin[3]. [1]Division of Natural Sciences, Concord College, Athens, WV 24712; [2]Department of Plant Pathology, Physiology and Weed Sciences, Virginia Tech, Blacksburg, VA 24061; and, [3]American Chestnut Cooperators' Foundation, 2667 Forest Service Road 708, Newport, VA 24128, USA

American chestnut trees are difficult to propagate. We have had our greatest success using the bark-grafting method developed by Bruce Given. While the low success rate (ca. 10% on both American chestnut and Chinese chestnut stock) is less than satisfactory, the procedure has been our most certain method of propagating large American chestnut trees (40-100 cm in diameter at breast height, dbh) that have survived blight infection since the original epidemic. In 1991 we began to graft American progeny that appear to have more blight resistance onto American chestnut stock growing in shallow cove mesic sites in the forest. Grafting success has been increased to ca. 20-50% by fertilizing the stock trees heavily with nitrogen 6 wk before grafting. Grafts on established root systems have yielded stem heights up to 3.5 m the first year, with nut production in 3 yr on stems up to 5.5 m high and 8 cm dbh. Controlled crosses have been made by removing the male catkins and bagging the female flowers 2 wk before pollen receptivity; by harvesting mature catkins, rubbing off the abundant pollen, sieving it through a 40-mesh screen, drying it over a desiccant (to prepare for seasonal use) and storing it at —20 C (for future use); and by applying the pollen with a brush onto misted female flowers at the time of receptivity. If the time of receptivity is right, three nuts per burr generally are produced.