

# DIRECT-SEEDING VERSUS CONTAINERIZED TRANSPLANTATION OF AMERICAN CHESTNUTS ON LOOSE MINE SPOILS IN THE CUMBERLAND PLATEAU<sup>1</sup>

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**Abstract:** American chestnut (*Castanea dentata* (Marsh.) Borkh.) was formerly an important timber and nut-producing hardwood throughout the forests of eastern North America. The introduction of an exotic fungal blight (*Cryphonectria parasitica* (Murr.) Barr) in the early 20<sup>th</sup> century devastated *C. dentata* populations. Blight-resistant chestnut backcrosses will be available for widespread distribution through The American Chestnut Foundation's breeding program in the near future. The development of blight-resistant backcrosses is only the first step of the restoration process. For successful introduction, information must be attained about the site requirements, establishment, and growth of American chestnut. An immediate obstacle to the restoration is *Phytophthora cinnamomi* (Rands), another introduced pathogen that causes a root rot disease. Surface mine spoils in the Appalachian coal region and elsewhere may initially be devoid of *Phytophthora* and prove suitable for the establishment of founder populations of blight-resistant chestnut hybrids which may then act as reservoirs for chestnut dispersal into surrounding forests. Four family lines of American chestnuts were planted in mine-run spoil using two planting techniques in the spring of 2006. The two planting techniques were direct-seeding and containerized transplantation. Each line and planting technique was replicated three times for a total of 24 plots, with each plot containing approximately 21 seedlings planted on approximately 2 meter by 2 meter spacing. After two growing seasons, seedling response varied by pedigree and planting technique. Indicators of stress (i.e. the formation of basal sprouts, a second leader, or blight infection) were significantly higher on containerized transplants than seedlings that were direct-seeded (56.2% vs. 11.7%). Overall, seedlings that were direct-seeded showed higher survival than transplanted seedlings (61.8% vs. 51.2%), while seedlings from containers exhibited better height growth (48.0 cm vs. 41.7 cm) and diameter growth (5.3 mm vs. 4.3 mm).

**Additional Key Words:** reforestation, restoration, Phytophthora.

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