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Competitive Interactions of American chestnut (*Castanea dentata*) during mine reclamation in Novel Ecosystems

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Trial plantings of American chestnut (*Castanea dentata*) are currently underway using reclaimed surface mines as reintroduction sites for hybrids bred for disease resistance to canker causing *Cryphonectria parasitica* (chestnut blight). Coalfields of the eastern US coincide with the species range, but little is known of its ecological interactions as it had largely been extirpated from the landscape by the 1940's. Non-native species such as *Lespedeza cuneata* (sericea lespedeza) have been planted extensively in the region for both agriculture and mine reclamation, and often dominate disturbed sites to form novel systems in place of native forests. We investigated the influence of herbaceous species on BC₂F₃ chestnut hybrid establishment and ectomycorrhizal (ECM) root colonization on three surface mines in eastern Tennessee that were restored using methods to avoid soil compaction. Hybrid chestnut growth, vegetation density, and species composition surrounding each seedling was assessed after eight growing seasons. ECM fungi present on root samples was quantified and identified by DNA sequencing of the ITS region. Sites differed significantly in herbaceous cover and seedling growth. Larger seedlings were found on the site that was comprised primarily of lespedeza. Average ECM colonization was similar across sites and groundcover vegetation diversity or sericea lespedeza did not influence ECM species richness. There was a difference in ECM community composition among the three sites with some fungi displaying subtle changes in species rank. Results suggest that in the absence of soil compaction, sericea lespedeza does not impede hybrid chestnut establishment or ECM root colonization in Appalachian afforestation projects.

Keywords: *Lespedeza cuneata*, FRA methods, mycorrhizal fungi