INFLUENCE OF WEED MATS AND TREE SHELTERS ON SURVIVAL AND HEIGHT GROWTH OF AMERICAN CHESTNUT ON POST-BOND RELEASE SURFACE MINES IN EASTERN KENTUCKY[1]

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Abstract: The use of surface mines for American chestnut reestablishment is gaining acceptance as numerous successful reforestation projects, following the Forestry Reclamation Approach (FRA), have been demonstrated on mine lands across Appalachia. American chestnut (*Castanea dentata*) was formerly the most important hardwood species throughout the forests of eastern North America, but introduction of an exotic fungal blight (*Cryphonectria parasitica*) in the early 20th century decimated *C. dentata* populations. The American Chestnut Foundation has been working to develop blight-resistant chestnut backcrosses that may soon be available for widespread distribution. To ensure a successful reintroduction, information on site requirements, establishment, and growth of American chestnut is needed. Surface mine spoils in the Appalachian coal region have been suggested as potential sites for the establishment of founder populations of blight-resistant chestnut hybrids which may then act as reservoirs for chestnut dispersal into surrounding forests. Three post-bond mine lands in eastern Kentucky that were reclaimed as hay land pastures were dozer ripped and planted with bareroot 15/16 backcross chestnuts. A study to examine the need for using weed mats and tree shelters on these sites was initiated due to concern of herbaceous competition and browsing from deer and elk. At each site, 25 chestnuts were planted in each of twelve plots that contained the following treatments (n=3): (1) control; (2) weed mats; (3) tree shelters; and (4) tree shelters plus weed mats. After two years, seedling survival was significantly higher in the shelter (85%) and shelter + mat (85%) treatments than the mat (51%) and control (37%) treatments. Seedling height was also greater in the two shelter treatments (116 and 112 cm for shelter and shelter + mat, respectively) than the mat (65 cm) and control (60 cm) treatments. Browse was moderate to heavy on the non-sheltered seedlings, while essentially absent on the sheltered plots.

Additional Key Words: reforestation, restoration, herbivory, competition.

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