

INFLUENCE OF DIFFERING MINE SITE CHARACTERISTICS AND PLANTING TREATMENTS ON SURVIVAL AND BUD SET TIMING OF *CASTANEA DENTATA*¹

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Abstract: Reforestation on mine sites requires the use of species adapted to harsh conditions experienced by those mine sites. Studies show that American chestnut (*Castanea dentata*) is a suitable species due to its adaption to xeric conditions and high light intensity characterized by surface mines. Here we compare the date of budset in American chestnut planted on two sites, but differing in genetic stock, planting date, and planting method. Budset is signaled by photoperiod, but can also be influenced by temperatures and nutrient availability. Understanding the relationship between budset timing and planting treatment in the American chestnut will prove beneficial to reclamation, and the restoration of the species. Individuals that set bud late will experience longer growing periods, but risk damage due to freezing temperatures.

The study location was on a mine site reclaimed using the FRA in eastern Tennessee. Two sites, containing two plots each, had similar substrate but differed in topography and material placement. Conditions on one site are characterized by loosely dumped spoil piles, placed on a gentle slope with a northeasterly aspect. The second, steep slope, site conditions are characterized by a moderately graded surface, with a southeasterly aspect. To one lot of seed, nine treatments were applied. Treatments were in a factorial arrangement with factors of forest topsoil (sterilized and un-sterilized), Terra-Sorb (applied and not applied), and fertilizer pellets (applied and not applied). Chestnuts were directly seeded in rows with randomized treatments. A second lot of seed was planted in randomized locations within the same plots, but at a later planting date. Bud set was recorded every two weeks, starting in August, until more than 90% of the trees had set bud. The objective of this study is to determine the influence of site and planting treatments on survival and bud set. Survival in the first planting lot averaged 30% survival after 2 months. Fertilizer significantly reduced emergence and survival from 38-30%. This earlier planting group set bud sooner than the second group. Second lot survival ranged from 55-72% after 2 months.

Additional Key Words: dormancy

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