

ECTOMYCORRHIZAL CHESTNUT SEEDLINGS IN REFORESTATION EFFORTS ON RECLAIMED LANDS IN OHIO¹

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Abstract. Excessive use of forest lands for mining has produced vast regions unsuitable for natural reforestation. In Southeastern Ohio alone, there are more than 600 000 acres of land that had been subjected to coal mining and about 50 000 acres have soil that has a very low pH and heavy metal content. Various agencies of the State of Ohio have been working on reclamation and reforestation of these regions.

We plan to utilize mycorrhizal chestnut seedlings in reforestation of these areas. American chestnut was native to this area before the invasive blight fungus (*Cryphonectria parasitica*) almost eradicated the once third most dominant tree species of this region. Reintroduction of this species will serve both reforestation efforts of reclaimed lands as well as restoration of the American chestnut tree.

We are using two approaches towards this restoration/reclamation effort. The first one is to identify ideal progeny from a cross-breeding program that has the blight resistance as well as the superior traits of the American chestnut tree. We have molecular markers that are being used in PCR assays to identify such progeny. Secondly, we are identifying suitable ectomycorrhizal fungi that can associate with chestnut seedlings and provide assistance in their survival, growth and establishment in reclaimed lands. To date, we have identified five species of ectomycorrhizal fungi that can form symbiotic associations. These mycorrhizal seedlings, when planted in adverse soil conditions, appeared to perform better than non-mycorrhizal controls. In addition to these five species of ectomycorrhizal fungi, we have identified two novel strains of fungi that form mycorrhiza on chestnut roots. These are being identified using molecular tools.

The research shows that ectomycorrhizal chestnut seedlings will be very useful in reforestation of reclaimed mined lands and also in restoration of the American chestnut.

Additional Key Words: Reclamation, Restoration, Ectomycorrhiza, chestnut blight.

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