ECTOMYCORRHIZAL FUNGI FORMING SYMBIOTIC ASSOCIATION WITH THE AMERICAN CHESTNUT

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ABSTRACT

Because of the ever-increasing demand for wood and other forest products and increased restrictive regulations for harvesting trees from public land, commercial farming of forest trees is becoming a necessity. For this, it will be essential to exploit all the available commercial land, whether or not it is ideal for optimal growth of forest tree species. In addition, past use of forest lands for mining and farming have 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 mining, which are now under reclamation program. Nearly 50,000 acres have soil that has a low pH.

Mined land sites are generally known to be nutrient poor and contain soils that are in dire need of stabilization to prevent erosion. Reclamation practices have included use of mycorrhizal inoculum to establish successful plant communities on mined sites. Mycorrhizae benefit the vegetation by increasing a plant's ability to survive in a nutrient poor and water deficient environment. In undisturbed ecosystems, mycorrhizal relationships occur naturally. However, in mined sites these fungi need to be reintroduced into the environment for reforestation to be successful. In addition, newer and improved strains of fungi are required initially to combat and remedy the harmful effects of pollution, before the once indigenous strains can take hold in the affected regions.

We are utilizing American chestnut trees, once common to this region, for reforestation of reclaimed mined sites in southeastern Ohio. We have identified several ectomycorrhizal fungi that can associate with the American chestnut using transmission electron microscope and molecular analyses. We have been planting mycorrhizal chestnut seedlings generated in the laboratory in reclaimed lands to assess the benefits of these fungi on survivability and growth of these seedlings. The studies will benefit both reforestation and reclamation of mined sites as well as restoration of the American chestnut.