

Native vegetation in reclamation: improving habitat and ecosystem function through using prairie species in mine land reclamation¹

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Abstract: In the Appalachian region, coal mining has impacted 600,000 hectares historically. While a return to forest would be a preferable postmining land use, due to the difficulty and higher costs of reforestation, many sites are reclaimed into non-native grasslands. The typical seed mix for these grasslands is low diversity and consists of exotic, cool season grasses and forbs. For this study, we combined several species in standard reclamation mixes with prairie species native to North America to create a higher diversity planting on three mine sites in southeastern Ohio. Vegetation and soil microbial properties were assessed within two years after site establishment. Results were encouraging. The mix that included native plants met reclamation standards of ground cover two years after planting, indicating these alternative mixes can be successful. The first year species richness and diversity were higher in native planted areas when compared with traditional, the second year they were equal between treatments. Soil beta-Glucosidase activities tended to be lower or higher in the native planted areas, in contrast to soil organic matter, which was generally higher under native prairie mix. Microbial biomass, Actinobacteria, and gram negative bacteria estimated by ester-linked Fatty acid methyl esters occasionally appeared to be higher under native prairie mix indicating that the experimental mix may have a positive effect on soil microbial biomass after almost two years of establishment. Incorporating hardy native prairie plants into reclamation seed mixes can increase the value of the ecosystem for pollinators and wildlife, and potentially improve soil conditions more quickly than non-native plantings alone.

Additional Key Words: native plants; prairie restoration; soil beta-Glucosidase activity; soil microbial community composition and biomass.

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