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Establishment of Earthworms on Reclaimed Lignite Mine Soils in East Texas

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Lignite mining helps to fuel 25% of the electricity in Texas and provides a stable, low cost source of energy for Texans. After mining, mining companies are required by the Texas Mining Reclamation Act or TMRA (1975) to restore the land and environmental values to the mining site. Although earthworms are an important part of the below-ground ecosystem and contribute to many soil conditions that are favorable for plants, previous research on east Texas mine soils has not addressed earthworm community development after afforestation on lignite mine soils. This study looks at the earthworm abundance and species composition under pine and mixed pine and hardwood plantings on reclaimed lignite mine soils aged 5, 15 and 25 years since planting in east Texas. The results of a 2-way ANOVA found cover type ($p< 0.0001$) and age since reclamation ($p=0.0027$) significant with a 5% error rate. However, earthworm abundance decreased from age 15 to age 25 in both pine and mixed pine and hardwood stands. Analysis of the species composition revealed 86% of the species identified to be native earthworms and 14% to be exotic species. The results of this study may contribute valuable knowledge to the science of lignite mine land reclamation and begins to offer a deeper understanding of earthworm community development in east Texas soils.