

CAN TRANSPIRATION RATES TELL THE POTENTIALITY OF MINE RECLAMATION GROUND COVER?¹

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Abstract: Competitive interactions between woody and ground cover species was an important issue in ex-coal mining areas in Appalachia region. Plant selection is required to guarantee the reforestation success and transpiration rate may be used to predict the adaptability of the selected plant species. The study aimed to determine whether transpiration rates can be used to predict ground cover success on mine reclamation sites. The experiment consisted of a randomized complete block design with three replicates. Fifteen grass and herb species were planted in PVC pots (305 mm height and 100 mm diameter) in three soil types i.e. quarry soil, coal spoil, and vermiculite and pure beach sand mixture at 1:1 (v:v) ratio. The plants were grown in a green house with 23.9–27.7°C/18.3–21.1°C (day/night) temperature and 48.0/48.5% (day/night) average humidity, and were watered daily during the study. Plant height and cover and transpiration rates were measured throughout the investigation period. Mean plant cover was significantly different between soil types, being greatest in quarry overburden and least in the sand/vermiculite. Plant height did not differ between quarry and coal overburden, but was greater in these soils than in sand/vermiculite. Red clover (*Trifolium pratense* L.) and white clover (*Trifolium repens* L.) both Fabaceae performed consistently well across all three soil types. A relationship was found between transpiration rate and plant growth.

Additional Key Words: quarry soil, coal spoil, plant selection criteria

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