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The Physiological Characteristics to Estimate Species Potential as Mine Reclamation Ground Covers[1]

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Abstract: In finding what physiological characteristics can be used to predict ground cover success on mine reclamation sites, fourteen herb and grass species, whose seeds are widely available commercially within the southeastern United States, were tested. Establishment and early growth was tested on three different soils i.e. vermiculite and quartz sand mixture, quarry overburden, and coal mine overburden in a greenhouse. We tested germination rates in the pH range of 5–10, and the early growth, chlorophylls a and b, and carotenoids pigment content, and transpiration rates of 14 herbaceous species to determine whether these traits can be used to predict ground cover success on mine reclamation sites. The preliminary results indicate that plant height and cover, transpiration rate, and foliar pigments may be used to select plant adaptability to mined soil. Red clover (*Trifolium pratense* L.) and white clover (*Trifolium repens* L.) showed the greatest potential as ground cover for mined soils in the eastern United States. Species with a moderate growth rate, which may be able to tolerate and persist in the low-nutrient environment of reclaimed mines, are more likely to be adopted for widespread use. The field experiment is being conducted to monitor the growth performance of the clovers in the field, and which soil factor affect most.

Additional Key Words: physiological characters; cover crops; reclamation; mine revegetation; red clover and white clover

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