

Recolonization of Vesicular-Arbuscular Mycorrhizae on a Reclaimed Strip Mine in North Dakota. John Reed Cockrell, Graduate Student, Dept. of Animal and Range Sciences, North Dakota State University, Fargo, ND 58105.

Vesicular-arbuscular mycorrhizae (VAM) are an integral component of North Dakota grassland ecosystems. Stockpiling topsoil in the process of mining lignite coal can drastically reduce the number of viable VAM propagules; reestablishment of VAM is therefore an important measure of reclamation success. Numerous soil parameters as well as topography and age of the reclaimed soil may all influence VAM recolonization. This study investigates the relationship of VAM infection to numerous soil properties, basal cover and time since reclamation. Thirteen transects of ten points each have been laid out on the Glenharold Mine near Stanton, North Dakota. Four transects have been placed on undisturbed sites, four on a site reclaimed in 1979 and five on a site reclaimed in 1984. Topographic data have been collected at each transect point, along with percent basal cover of plant species and numerous soil properties: pH; electrical conductivity; saturation percentage; calcium magnesium, sodium and sodic adsorption ratio (SAR); and sand, silt and clay percentages. Root samples of Agropyron smithii (a cool season grass) and Bouteloua gracilis and B. curtipendula (warm season grasses) were excavated at each transect point, and stained, and analyzed under a microscope to determine percent mycorrhizal infection. Preliminary data indicate that VAM infection is significantly higher on the reclaimed sites than it is on undisturbed sites, for both cool season and warm season species. Undisturbed sites exhibit VAM infection levels of $7.60 \pm 0.52\%$ for Agropyron and $6.58 \pm 0.50\%$ for Bouteloua, while the site reclaimed in 1979 exhibits $24.43 \pm 0.88\%$ infection for Agropyron and $17.43 \pm 1.20\%$ for Bouteloua. The site reclaimed in 1984 exhibits $15.57 \pm 0.66\%$ VAM infection for Agropyron. There appears to be little, if any correlation between infection level and basal cover or soil properties. No trends in infection level due to topography have been noted.