

The use of Mycorrhizal Fungi in Reclaiming a Landscape: Importance and Predictability. Michael F. Allen, Associate Professor, and Carl F. Friese, Research Associate, Department of Biology, Systems Ecology Research Group, San Diego State University, San Diego, CA 92182-0057.

Mycorrhizal fungi form mutualistic associations with desirable plant species. They regulate nutrient, water, and CO₂ uptake of individual plants, alter competitive outcomes between plants, and alter soil nutrient availability. Nevertheless, there is no single "mycorrhizal response" as a high diversity of these fungi are represented in any natural area and the differing fungi have differing effects on host plants. Moreover, few of the diverse mycorrhizal fungi important for reclamation can be grown in large volumes for inoculation and these are only the ectomycorrhizal forms. However, many mycorrhizal fungi immigrate rapidly by animals and wind onto disturbed sites. By applying ecological theory, we can often predict which vectors of dispersal and what patterns of natural invasion occur in some habitats. We suggest that the application of these models should lead to planting better plant species mixtures and placing those plants in patterns that enhance natural mycorrhizal fungal invasion and establishment. Because of these factors, it is essential that several parameters be considered for reclamation success. These primarily include the spatial arrangement of plants and the animal immigration carrying the fungi. Subsequently, assessments of mycorrhizal density (plant + fungus) and mycorrhizal fungal species diversity would determine the success of management practices.

