

RESTORATION AT THE ROOTS: MYCORRHIZAL INTERACTIONS AND
HABITAT RESTORATION IN GLADES AND PRAIRIES

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ABSTRACT

In a fragmented landscape, habitat patch characteristics indirectly alter the distribution of organisms through impacts on their symbiotic partners. Arbuscular mycorrhizal fungi (AMF) are obligate plant symbionts and play a crucial role in plant community structure and restoration of native plant communities; however, very few studies have examined how overall habitat patch characteristics such as size, successional age, and isolation influence mycorrhizal interactions. In this dissertation, I examined how habitat patch characteristics influence AMF-plant interactions and the role of soil microbes in plant community restoration of fragmented Missouri grasslands. In glades of the Ozarks, AMF root colonization increased with time since restoration began, and from core to edge habitat within glades. Restoration stage also impacted AMF community composition in calcareous glades, but restoration stage played a larger role in AMF community composition in prairies. In glades, underlying bedrock was correlated with changes in AMF community structure. I then explored whether addition of two native glade plant species along with soil inocula from well restored glades catalyzes the spread of native microbial communities (including AMF), thus impacting plant establishment and growth in newly restored glade sites. Results suggest that impact of soil inoculum on nurse effects vary in magnitude and direction among host species. Thus a mosaic of habitat modification regimes could promote plant species diversity in glade restoration.