

The effects of arbuscular mycorrhizal fungal inoculation at a roadside prairie restoration site

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Arbuscular mycorrhizal fungi (AMF) may play an important role in ecological succession, but few studies have documented the effectiveness of mycorrhizal inoculation at restoration/reclamation sites. At a roadside prairie restoration in Shakopee, Minnesota, we compared AMF root colonization and resulting vegetative cover among four inoculation treatments. After 15 mo of growth, we found that AMF colonization was high in all treatments but was significantly higher in treatments that received AMF inoculum propagated from a local prairie site or commercially available inoculum than the uninoculated control. For the prairie inoculum, this increase in colonization occurred whether the inoculum was applied with seeds in furrows or broadcast with seeds on the soil surface. However, increased colonization did not discernibly affect the restored vegetation; neither total vegetative cover nor the proportion "desired" prairie vegetation differed among inoculation treatments. By the end of the third growing season (27 mo after planting) there were no longer differences in AMF colonization among the inoculation treatments nor were there differences in vegetative cover. It is likely that natural recolonization of the plots by remnant AMF populations at the site limited the duration of the inoculation effect. This natural recolonization, in combination with relatively high soil phosphorus levels, likely rendered inoculation unnecessary. In contrast to previous published studies of AMF inoculation in landscape restorations, this study shows that AMF inoculation may not be warranted under some circumstances.

Key words: arbuscular mycorrhizal fungi, commercial inoculum, indigenous inoculum, inoculum application methodology

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