

ROLE OF MYCORRHIZAL FUNGI IN NATIVE AND RECONSTRUCTED TALLGRASS PRAIRIES

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Abstract: Less than 0.1% of tallgrass prairie remains in Iowa, Wisconsin, Illinois, and Indiana. A goal of tallgrass prairie reconstruction in these states is to return native plant species composition. Native tallgrass prairie is a highly diverse ecosystem, and small-scale plant community composition is not replicated in prairie reconstructions. Soil biota play a role in the nutrient dynamics of the prairie and growth of tallgrass prairie plants. Arbuscular mycorrhizal (AM) fungi form a symbiotic relationship with plants generally providing nutrients to plant hosts and aiding in seedling establishment. AM fungal communities differ between tallgrass prairie and agricultural land, with agricultural fungal species more adapted to disturbance and colonizing single plant species. As the majority of tallgrass reconstructions occur on former row crop fields, the AM fungal community in the cropland is not likely to consist of the network-forming fungal species of the tallgrass prairie. I hypothesize that AM fungi act as a biotic filter in plant-species-rich tallgrass prairie reconstructions preventing certain plant species from establishing. To address my hypothesis, four paired native-reconstructed prairies were sampled in different landform regions in Iowa. Plant and AM fungal species composition were sampled in seven 70 cm x 70 cm (0.5 m²) plots per prairie. Plant cover was estimated using the point-intercept method and 3 soil cores (2.25 cm dia. to the lower epipedon depth) were collected for AM fungal species analysis in the lab. Preliminary data indicate that plant species diversity is greater in the native prairie and that the AM fungal species composition differs between the native and reconstructed prairies.