**Plant-associated soil microbes respond rapidly to prairie establishment**

Soil microbial communities are an important component of ecosystems because of their key roles in nutrient cycling, influence on plant community composition, regulation of plant productivity, and decomposition of organic matter. The recovery of these communities is an important element in the process of returning a restored ecosystem to its desired structure and function, but this recovery often lags behind changes in land use and management. For this reason, it is important to know how quickly soil microbial communities respond to establishment of a plant community and its management. Researchers in the Great Lakes Bioenergy Research Center assessed patterns of microbial diversity and abundance in corn and prairie plots two to four years after establishment in agricultural fields, using phospholipid fatty acid biomarkers extracted from the soil. These markers were used because of their relatively high abundance and wide chemical variety in soils, and their ability to gauge responses of microbial communities to various soil characteristics such as heavy metals, pH, and water availability. Researchers tracked total biomass, functional group biomass, and overall lipid composition in corn and prairie plots, and found that despite no changes to the biomass of Gram-positive bacteria and actinomycetes, total biomass, arbuscular mycorrhizal fungi biomass, and Gram-negative bacteria biomass were significantly higher in the restored prairie plots than in corn, actually approaching levels found in long-established, unmanaged prairies. These results indicate that plant-associated soil microbes in agricultural soils can shift in less than two years after establishment of perennial grasslands on formerly cropped lands. Their findings suggest the latent microbial community in certain soils may be sufficient to support rapid reestablishment of key microbial functional groups when land use is changed.

**References:** Herzberger, A.J. et. al. 2015*. Bouncing Back: Plant-Associated Soil Microbes Respond Rapidly to Prairie Establishment.* **PLoS ONE**, doi: 10.1371/journal.pone.0115775.

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