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THE ROLE OF SOIL MICROBES AND PLANT DIVERSITY IN POLLINATION AND SOIL CARBON SEQUESTRATION UNDER CLIMATE CHANGE

Erin Carroll and Savannah Fuqua

Mentor: Scott Mangan

It is well-established that an ecosystem's functioning, and thus the services it provides us, is related positively to its biodiversity. Further, it is known that soil microbial communities play an important role in maintaining this relationship between plant diversity and ecosystem functioning. How the relationship between soil microbes, plant diversity and ecosystem functioning will be affected by a changing climate, however, remains unclear. In order to explore these interactions we examine how pollination and soil carbon sequestration, two important metrics of ecosystem function, are affected by plant community diversity, drought, and soil microbial communities within the context of native tallgrass prairies. Specifically, as previous data has shown that soil microbes have a strong influence on the fecundity of individual plant species in this system, we attempt to determine whether this is through a direct effect on plant fitness or an indirect effect by mediating plant-pollinator interactions. Additionally, as our lab has shown with past data that systems with live soil microbial communities continue to sequester carbon under drought conditions better than systems with sterile soil, we examine how the same measurements are affected by different gradients of plant community diversity.