

Macrophomina phaseolina Hot Spots and Correlations with Soil and Plant Factors

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*Fairmount College of Liberal Arts & Sciences
Natural Sciences & Engineering Poster Presentation*

Abstract: *Macrophomina phaseolina* is a fungal pathogen capable of infecting over 500 plant species across the world and one of the most important pests of soybeans in Kansas. Investigation has been conducted on *M. phaseolina*'s presence, due to its effects on agriculture and crop yield. Conversely, minimal research has examined the fungal pathogen's significance in native prairie communities, its correlation with environmental factors, or its spatial structure. Our goals are to better understand *M. phaseolina*'s behavior in native prairies in hopes to apply these insight to agricultural systems. In the summer of 2020, we quantified the spatial structure of *M. phaseolina* in a 15 x 15 m grid of untilled tallgrass prairie and correlated *M. phaseolina*'s abundance with soil and plant characteristics. We found a high variability in the density of *M. phaseolina* and limited evidence for spatial aggregation of pathogen abundance. Additionally, bivariate analysis revealed weak correlations between pathogen abundance and individual soil properties and no correlation between pathogen abundance and plant variables. The results found rule out several key factors and suggest a better understanding of how physical disturbance and the mechanism of spread for *M. phaseolina* contribute to the large differences in density observed.

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