Effect of Fungi on Arid Grasses and Commercial Crops Under Varying Environmental Conditions

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Climate change is an important challenge facing the world today. In many parts of the world climate change models predict an increase in extreme weather events including increasing surface temperatures and drought. The consequences of climate change will not only effect natural eco-systems, but we can expect to see a decrease in water supplies and complications in agriculture and food production. Arid grasses have been studied for their drought and heat tolerance properties and represent a potentially important resource for mutualistic fungi that provide plant protections. The purpose of this project is to determine the effect of Lasidiplodia and Michrodocium (known plant pathogens) on commercial crops (corn, soybeans, rye, and blue gramma) in arid climates. Seeds from three commercial crops (rye, corn, soybeans) and one native arid grass (blue gramma) were surfaced sterilized and planted in sand (with fungi and without fungi) containing 10% water content and grown for 10 days. Results indicated mixed plant responses in plant growth. Lasidiplodia showed pathogenicity to soybean germination and soybean growth. Michrodocium showed growth promotion in both rye and soybeans. Dark septate fungi varied in their response to plant growth and pathogenicity. As the world becomes more dependent on agriculture to feed the growing population, it is important to find sustainable ways to increase yields, and fungi such as these dark septate may provide solutions for agriculture faced with a changing climate.

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