The Development of Bacillus subtilis as an Environmental Competitor for Bacterial Leaf Streak

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The first observation of Xanthomonas vasicola pathovar vasculorum, commonly known as bacterial Leaf Streak being in the United States occurred in Nebraska. As of August 2016, was identified to be affecting the foliage of many types of corn. Since then the disease has been confirmed in eight other states across the corn belt, and there is still no known control method. The project was chosen to see if Bacillus subtilis could be used as an environmental competitor to potentially suppress the growth of Xanthomonas vasicola pathovar vasculorum. Therefore, the question tested in this experiment is “How will Bacillus subtilis compete with the growth of Bacterial Leaf Streak in a vivo soil study and a vitro microbiology study. Bacillus subtilis has been found to naturally compete and reduce the growth of various pathogens in agriculture through plant growth promotion, antibiosis, competition for space and nutrients, cells lysis of pathogens, and induced systematic resistance. To begin B. subtilis and Xvv. were created into soil inoculants to be used in a soil enumeration study. The procedure was conducted by placing both bacterial strains into the same environment allowing them to grow. When the bacteria were pulled out of the soil, a dilution series using selective agars were used to identify which bacteria was most populated in the soil. Kirby Bauer disk diffusion test was then conducted with the surfactin pulled from the B. subtilis to assess its effect against Xanthomonas vasicola pv. vasculorum. The initial results are currently being assessed for accurate measure and interpretation of data. Statistics are also underway to accurately analyze the data.

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