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Identification of the relationship between chemical and biological factors impacting corn productivity

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The definition for soil health as intended for agriculture may be best described as a soil that provides the optimal productivity to a primary crop over an extended time while having the minimum impact on plant, animal, and human health. However, we require a much better understanding of what is a healthy soil agroecosystem, how to identify it, and how to repair damaged sites for optimal crop productivity. Our studies focus on identifying the key drivers associated with soil health at sites where high and poor yields of corn occur within an agroecosystem. The initial project examined the same corn variety grown at a site developed by Mr. Dean Glenney where strips of corn and soybeans are alternated yearly under no till conditions. The yields continued to increase at this site over its twenty plus years of production. Using this site and a farm using conventional corn production and planting the same seed lot, we examined numerous input factors with a focus on identifying the phytobiomes associated with various tissues of corn plants sampled from the two locations. The objectives were to identify when to look, where to look, and how to look. Molecular analysis using TRFLP provided rapid and low cost means of separating the microbial profiles among samples. Both bacterial and fungal microbiomes were found to be similar on comparable tissues at the two sites in the early phases of growth. However, the microbiome found on the roots differed from that of the sap collected from the stems. By the V10 stage there were very significant differences in the microbial profiles of stem sap and leaf tissue from corn collected from the two sites but the microbiomes of the roots were more similar. The differences found at V_{10} stage became less apparent as the plants aged and became senescent. The changes in the plants microbiology and their relationship to yield will be discussed.

Biography

Saveetha Kandasamy graduated with her Doctoral Degree from Tamil Nadu Agricultural University, India in 2010, Specialized in Plant Microbe Interactions and Biological control. Moved to Canada in May, 2010 with Post-Doctoral appointment at Dalhousie University, worked 4 years and continued her research in Agriculture Canada, as NSERC-Visiting Fellow for another year. Subsequently, she joined as Research Scientist at A&L Biologicals, where she is leading 5-year Agricultural Innovation Program research focusing on plant and soil health from ecological perspectives. Saveetha Kandasamy has published about 25 research papers in refereed scientific journals and 3 book chapters. She is a winner of Dr. M. J. Narasimhan Academic Merit Award for the year 2009 (which is given every year to a young Plant Pathologist in India at the national level), developed a commercial microbial bioformulation. She has participated and presented in several national and international conferences, won some best paper and travel grant awards.

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