

# Immediate Impacts of Soybean Cover Crop on Bacterial Community Composition and Diversity in Soil under Long-Term *Saccharum* Monoculture

## *Background/Objective*

Long-term monoculture results to soil degradation and changes in cropping management, such as cover crops, can improve soil health and productivity. Sugarcane, a high biomass crop important for sugar and bioenergy production, is extensively cultivated as a monoculture. In this study, we determined whether introduction of soybean cover crop in a soil subjected to long-term sugarcane monoculture will induce diversity and compositional differences on rhizospheric microbial communities.

## *Approach*

The experimental plots were established at the USDA-ARS Sugarcane Research Unit Ardoyne Farm in Schriever, LA. Near full length (~1,400 base pairs) of 16S rRNA gene sequences were extracted from the rhizospheres of sugarcane, and soybean and fallowed soil were compared.

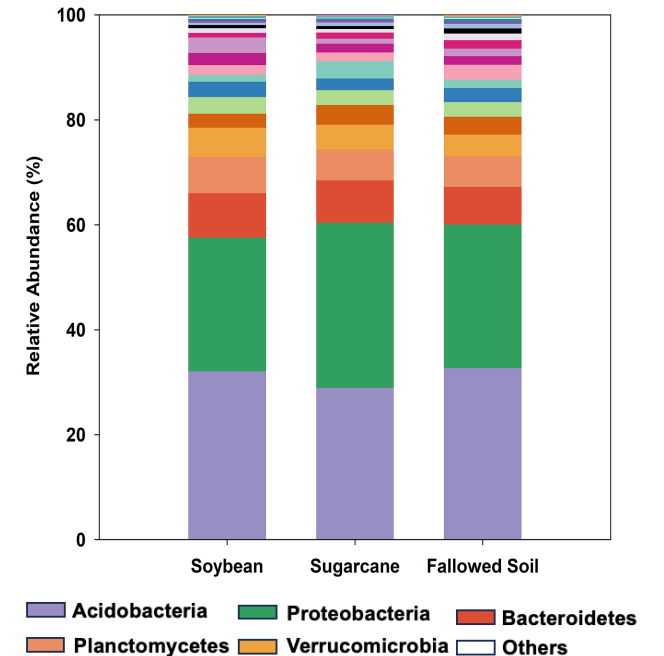
## *Results*

Higher soil bacterial diversity was observed in the soybean cover crop than sugarcane monoculture across all measured indices. Non-metric multidimensional scaling analysis showed distinct groupings of bacterial operational taxonomic units according to management system, indicating compositional differences among treatments.

## *Significance/Impacts*

This study indicates cover crops could have a restorative effect and potentially promote sustainability in long-term *Saccharum* production systems, as well as offset yield decline. Although this study included only three cropping systems in a single crop year, results illustrate that the use of cover crops increases bacterial diversity and impacts community composition. Thus, incorporation of leguminous plants as cover crops is a viable management strategy that will likely improve the sustainability of sugarcane production systems and can be predicted for energy cane.

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**Relative abundances of bacterial phylotypes sequenced from DNA from soybean and sugarcane rhizospheres, and fallowed soil.**