Methodologies to Assess the Impact of Genetically-Modified Crops on Soil Biological Properties Using Diagnostic Techniques. (S03-kremer165121-Oral)

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Abstract:

Ecological assessment of genetically-modified (GM) crop impacts on microbial communities has received little attention. GM crops may release exudates into soil causing changes in rhizosphere microorganisms. How GM crops influence microorganisms is important in evaluating effects on soil biological processes. Because microbiological assays based on cultural methods reveal 1 - 10% of soil microflora, sensitive methods involving phenotypic and genotypic assays are necessary to better assess microbial diversity. Phenotypic assays including enzyme activities, fatty acid analysis and substrate utilization provide physiological and functional bases for characterizing microbial communities. Phylogenetic techniques based on PCR-amplified 16S rDNA fragments from soil microbial DNA, including DGGE, T-RFLP and SSCP describe diversity and composition of the soil microbial community. Reported impacts of GM crops on soil microorganisms are inconclusive, suggesting that influences of biotic and abiotic factors on interactions of GM crops and soil microorganisms require further investigation. Assessments of diagnostic techniques currently used for describing relationships of crop type and soil environmental factors with microbial community structure and function will be presented.

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