MICROBIAL COMMUNITY STRUCTURE AND DIVERSITY IN FUMIGATED SOILS

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Concern over the destruction of the Earth's ozone has prompted a ban on the use of the broad-spectrum soil fumigant, methyl bromide. Four methyl bromide alternatives: propargyl bromide, methyl iodide, chloropicrin, and 1,3-dichloropropene are being tested for effectiveness. We are evaluating microbial community structure and diversity in two different types of soils after fumigation. We predict loss of both microbial abundance and diversity as a result of fumigant treatments. Soils were collected at one and four week, post fumigation and a final analysis at seven months with four replicas each. Total soil DNA extractions were subjected to PCR amplification using fungal and bacterial primers targeted to rDNA. DNA levels decreased after fumigation. We also determined the number of fungal morphology types and compared results to non-treated and methyl bromide treated soils. Non-treated soils contained the greatest number of fungal morphological types; with methyl bromide treated soils the least. Furthermore, the morphological types found varied with the fumigant used. This suggests fumigant treatments affect the microbial community and at least some of the effects are fumigant specific. To investigate loss of diversity, restriction digests were performed on amplified DNA fragments from both bacteria and fungi primers.