CHANGES IN SOIL MICROBIAL ACTIVITIES UNDER DRIP FUMIGATION

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We assessed the impact of chemical alternatives to methyl bromide on indigenous soil microorganisms. Emulsified formulations of chloropicrin, 1,3-dichloropropene, methyl iodide, and propargyl bromide were applied to field plots through the drip irrigation system. Methyl bromide was applied by shank injection. Soil was collected 1 week, 4 weeks (at strawberry planting), and 30 weeks after fumigation and assayed for microbial biomass, respiration, nitrification potential, and enzyme activities. Fumigation initially inhibited microbial respiration, nitrification potential, dehydrogenase, and arylsulfatase activities. After four weeks, nitrification potential in chloropicrin-treated plots approached levels observed in nonfumigated soil. There were no differences in microbial respiration, nitrification potential, and dehydrogenase activity among treatments after 30 weeks, but for certain treatments, acid phosphatase and arylsulfatase activities remained depressed. Microbial biomass C and glucosidase enzyme activity were not affected by fumigation. In addition to these measurements, shifts in microbial community structure in response to fumigation were determined by analysis of whole-soil RFLP band patterns. Preliminary results indicate that fumigation, particularly with methyl bromide, reduces microbial diversity. Impacts of specific fumigants on community structure will be discussed.