

Improvement of Soil Solarization with Volatile Compounds Generated from Organic Amendments

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Combining organic amendments with soil solarization is a nonchemical approach to improvement of the control of soilborne plant diseases. Pathogen control in solarized – amended soil is attributed to a combination of thermal killing and enhanced generation of biotoxic volatile compounds. Apparently, pathogen sensitivity to biotoxic volatile compounds is enhanced with an increase of soil temperature and acts in combination with antagonistic microbial activity. Enhanced biocontrol also may be involved with some amendments. Toxic volatile compounds including alcohols, aldehydes, sulfides, isothiocyanates, and others were detected in soil amended with cruciferous residues during heating. Field solarization of soil amended with composted chicken manure gave better control of pathogens and higher yield of lettuce and tomato than either treatment alone.

KEY WORDS: Soil solarization; organic amendments; cabbage; plant residues; fumigation; soil disinfestation.

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