Leaching Potential of Persistent Soil Fumigant Residues. (S11-guo578231-oral)

Authors:

- M. Guo^{*} Univ. of California
- S.R. Yates USDA-ARS, Riverside, CA
- W. Zheng Univ. of California
- S.K. Papinernik USDA-ARS, Riverside, CA

Abstract:

Persistent fumigant residues in soil resulting from agricultural pest-control practices may be released into water and leached to groundwater. This study aimed to evaluate the leaching potential of persistent soil fumigant residues examine the effect of dissolved organic matter (DOM) and ammonium thiosulfate (ATS) amendment. A silt loam soil was incubated separately with the fumigants 1,3-dicholoropropene (1,3-D), chloropicrin (CP) and methyl isothiocyanate (MITC) at 240-990 mg kg-1 for 35 d, followed by 48 h of evaporation. The soil was packed into stainless steel columns (1.5 cm ;Á 10 cm) and leached with water, 5 mM ATS and DOM solution (DOC 250 mg L-1) by gravity. Concentrations of 1,3-D, CP and MITC in column effluents ranged from 0.05 to 0.73, 0.16 to 0.81 and 0.05 to 0.27 mg L-1, respectively, when the soil was leached with 10 pore volumes of water. DOM did not promote the leaching of persistent fumigant residues, and ATS remarkably reduced the amount of 1,3-D and CP yet notably increased MITC recovered in the effluents. The results suggest that leaching of persistent fumigant residues in soil to water is significant, and movement of persistent fumigant residues in soil is not associated with DOM. Amending soil with ATS is an effective method to remove persistent residues of halogenated fumigants. To reduce groundwater pollution risks posed by fumigation, persistent soil fumigant residues have to be considered.

Speaker Information: Mingxin Guo, Univ. of California, U.S. Salinity Laboratory, 450 W. Big Springs Road, Riverside, CA 92057; Phone: (909) 369-4866; E-mail: mingxin.guo@ucr.edu

Session Information: Tuesday, November 4, 2003, 1:25 PM-3:45 PM Presentation Start: 1:45 PM

Keywords: Leaching; Fumigant; Residue; Soil