Organic Matter Effects on Phase Partition of 1,3-Dichloropropene in Soil. (A05-papiernik122106-Poster)

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Abstract:

The fumigant 1,3-dichloropropene (1,3-D) is considered a major replacement for methyl bromide (MeBr), which is scheduled to be phased out by 2005 in the United States. This study was conducted to better understand phase partitioning of 1,3-D and the role of organic matter in its adsorption to soil. Partitioning of 1,3-D between air and water (KH) and soil and water (Kf) was determined by quantifying the concentration in both phases upon equilibrium. At 20C, the KH of (Z)- and (E)-1,3-D was 0.052 and 0.033, respectively. In three California soils, the Kf (mg/L) of the 1,3-D isomers ranged from 0.39 to 0.60, and the Koc ranged from 35 to 60. The relatively high KH and low Kf imply that 1,3-D is highly mobile in most soils after subsurface application. Adsorption of 1,3-D, in native soils and soils amended with composted manure, increased with increasing soil organic matter content. This suggests that organic wastes can be applied to soil to increase 1,3-D adsorption, thus reducing its potential for offsite movement.

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