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METHYL-BROMIDE EMISSIONS FROM TARPED FIELDS

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Methyl bromide emissions from tarped fields

Once in the stratosphere, bromine atoms can destroy ozone effectively. Because of this potential effect, certain organobromine compounds including methyl bromide (MeBr) are being controlled or eliminated by national and international regulations. It would be valuable to determine the fraction of MeBr used in soil fumigations that subsequently enters the atmosphere to better assess the need for, and value of, strong regulations. We have designed and conducted several experiments accompanying field fumigations with MeBr/chloropicrin mixtures. In each of three field-fumigation experiments new Irvine, CA in which the fumigated field was covered immediately with plastic tarping, we have deployed static flux chambers on top of the tarping and measured escape fluxes of MeBr. After tarp removal, the same chambers were replaced on the bare soil to continue the measurements. We have also measured soil bromide contents before and after the fumigation. One experiment yielded an escape fraction of 80 to 87% (with 19% remaining as bromide) while the other two experiments yielded escape fractions of 30 to 35% (with about 70% remaining as bromide). This paper will summarize stratospheric bromine chemistry, describe the field experiments and discuss factors that influence emissions, including soil pH, moisture and organic content and injection technique. We acknowledge TriCal, Inc. for many helpful discussions and for professional field applications of MeBr.

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