Quantifying Methyl Bromide Emissions From Agricultural Fields

S.R. Yates, F.F. Ernst, J. Gan, F. Gao, A. Mutziger, D. Wang, W.F. Spencer and M.V. Yates, USDA-ARS and Univ. of California, Riverside.

Methyl bromide is a soil fumigant extensively used for the control of nematodes, weeds and fungi. Recent evidence suggests that methyl bromide may damage the ozone layer and, as a result of the Clean Air Act, is scheduled for phase-out within the next 5 to 10 years. The National Agricultural Pesticide Impact Assessment Program has determined that there will be substantial economic impact on the agricultural community if methyl bromide is restricted. One area of uncertainty which has been identified concerning the agricultural use of methyl bromide is the quantification of mass emitted from agricultural fields. To address this, two field experiments were conducted for a tarped, shallow-injected and a non-tarped, deep-injected application of methyl bromide to determine the emission rate into the atmosphere and the subsurface transport of methyl bromide for these management systems. Both experiments include a field-scale mass balance to quantify the partitioning of methyl bromide and to provide additional evidence that the flux measurements were accurate. This involves measuring the Br^- concentrations before and after the experiment to quantify methyl bromide degradation as well as the soil vapor concentration as a function of distance from soil surface. The volatilization rate was determined by several atmospheric and chamber methods to determine the mass lost at the soil surface.

M.V. Yates - 909-787-5488 (phone)
909-787-3993 (fax)

S.R. Yates - 909-787-4360 (phone)
909-787-3993 (fax)