SORPTION AND DESORPTION OF PHOSPHINE RELATIVE TO METHYL BROMIDE FOLLOWING POSTHARVEST FUMIGATION OF GRAPES AND CITRUS

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Abstract. Sorption, off-gassing (i.e., depuration), and residue data were obtained for both phosphine and methyl bromide following commercial procedures for chamber fumigation and cold-storage of table grapes as well as citrus. Results are presented in the context of quantifying fumigant inputs to ingestion exposure and worker inhalation exposure that are respectively derived from the consumption of fruit residues and off-gassing of palletized fruit in cold-storage. Relative to methyl bromide, ~10-fold less mass of phosphine is sorbed by palletized loads of fruit during fumigation, phosphine respectively off-gasses ~5- and ~20-fold faster from loads of oranges and table grapes in cold-storage, and respectively a ~7- and ~18-fold shorter amount of time is required for phosphine residues in oranges and table grapes to meet USEPA food tolerances.