44. Quantification of iodomethane in air samples from worker exposure and environmental monitoring/flux studies following application to plots via shank injection or drip irrigation

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Iodomethane is a soil fumigant under development by Arysta LifeScience North America Corp. as an alternative to the ozone-depleting methyl bromide. PTRL West coordinated field phases and conducted analytical portions for eight field volatility studies using shallow shank broadcast flat fume injection, raised bed shallow shank injection, and raised bed drip irrigation, all employing tarpaulin covered plots. Five studies included parallel worker exposure monitoring to provide data for assessment of occupational risk while conducting specific worker tasks. Methods and results from quantification of iodomethane residues, and calculated time weighted averages of residues in air (LOD typically <1 ppb) will be presented. Method validation, storage stability, and trapping efficiency will be addressed. The overall process of coordinating the diverse segments of these studies will be described.

45. Reducing fumigant emissions using surface tarps: Field and laboratory assessments

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Increasingly stringent regulations require that emissions of fumigants to the atmosphere be reduced to protect human and environmental health. Plastic tarps used to cover the soil surface during soil fumigation vary in their effectiveness as diffusion barriers. Virtually impermeable films (VIFs) have been developed that allow very little fumigant mass transfer across the film. Laboratory and field experiments were conducted to assess the permeability of polyethylene and VIF films to fumigant vapors and their effectiveness in reducing atmospheric emissions of fumigants. Results indicated that standard high-density polyethylene (HDPE) is relatively permeable to fumigant vapors, with the permeability increasing with increasing temperature. Cumulative fumigant emissions from soil tarped with HDPE are only slightly lower than emissions from bare soil. An intact VIF tarp can drastically reduce the maximum flux and cumulative emissions of fumigants from soil. Laboratory experiments indicated that VIFs reduced cumulative volatilization by at least 60% compared with 1-mil HDPE. Field trials showed similar results. However, in partially-covered fields (bare furrows in a bedded system), flux from untarped portions of the field contributed a large fraction of the total emissions.

46. Risk trade-off between methyl bromide and alternative chemicals, and techniques for reducing emissions in Japan

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For now, chloropicrin, 1,3-dichloropropene, methyl isothiocyanate and its generators are seen as the best alternatives to methyl bromide in Japan. Restrictions on methyl bromide required intensive searches for improved technologies and alternatives to reduce emissions, while maintaining effective disease control. Predictions of atmospheric concentrations of soil fumigants in the Kanto area were estimated by AIST-ADMER (National Institute of Advanced Industrial Science and Technology - Atmospheric Dispersion Model for Exposure and Risk Assessment). The results showed that average atmospheric concentrations of 1,3-dichloropropene under no covering condition is approximately equal level to our monitoring data, and that the total area greater than the atmospheric monitoring basis of 2.5 ìg/m^3 (US EPA IRIS, Integrated Risk Information System) reached 63%. This region will not be allowed to increase 1,3-dichloropropene use utilizing the conventional, no-covering method. If growers choose to use covering materials such as PEs and VIFs instead, the total area greater than the concentration basis is estimated to decrease to 26% and 0%, respectively.

47. Synthetic pyrethroids and California surface water

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Although organophosphate insecticides (OP) have been the primary focus of California pesticide/water quality issues since the early 1990s, agricultural OP use is decreasing and urban uses have been nearly eliminated. Synthetic pyrethroids (SP) are OP substitutes and their use has steadily increased. SPs have recently been detected in both the water column and in bed sediments of agricultural and urban waterways. In bed sediments, concomitant bioassays have shown that acute *Hyalella azteca* toxicity is correlated to total SP concentrations expressed as toxic equivalents. Addressing potential SP sediment toxicity is challenging from both a scientific and regulatory standpoint due to the unique physicochemical properties of SPs and their widespread use in virtually all sectors, including urban uses. This presentation provides an overview of California SP use, SP properties relative to the general universe of pesticides, and key technical issues relevant to SP environmental exposure assessments.

48. Ecological risk characterization for the pyrethroid insecticides

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In its re-evaluation of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Environmental Protection Agency (EPA) examines all significant routes of exposure. As individual pyrethroids have been re-evaluated, a distinct pattern of similarities and differences have emerged among them. The synthetic pyrethroids are characterized not only by similar