AIRBORNE FLUX AS A FUNCTION OF TIME OF TARP CUTTING FOR CHLOROPICRIN and 1,3-DICHLOROPROPENE

David A. Sullivan[1], Husein Ajwa[2], Suduan Gao[3], Mike Stanghellini[4], Afiqur Khan[2]

[1]Sullivan Environmental Consulting Inc.,, Alexandria, VA, [2]UC Davis, Salinas, CA, [3]USDA-ARS, Parlier, CA, [4]TriCal Inc., Hollister, CA

The management of airborne flux is an important consideration for agricultural fumigants. Research over the past ten years has made great progress in the management of flux in response to regulatory initiatives at the state and Federal levels. As the retention properties of tarp materials have improved, the flux at the time of tarp punching or tarp cutting can become the most limiting factor in terms of establishing buffer zones. In response to this issue, the University of California in conjunction with the California Department of Pesticide Regulation and Sullivan Environmental Consulting, Inc. conducted a research project in June 2011 in Lost Hills, California. The objective of this research was to identify optimal times to cut the tarp in terms of controlling secondary (or primary) peaks associated with this activity. Flux analysis was conducted by flux chambers (Dr. Suduan Gao), and also based on off-field airborne monitoring and regression analysis. The latter is the subject of this paper.

The specifications for each of the four fields evaluated are summarized below in Table 1.

As shown, the primary objective was to identify the optimal time for tarp cutting. The secondary objective was to demonstrate the benefits of potassium thiosulfate to further mitigate flux (as shown in the comparative trials #3 and #4.

Air concentrations for 1,3 dichloropropene and chloropicrin were measured at 1.5 m above ground level at locations 8 to 20 m off-field around each field. Regression analysis was then used to compute flux rates as a function of time for the entire monitoring period shown in Table 1.

Flux computations for 1,3 dichloropropene and chloropicrin as a function of time will be presented at the conference, as well as the total percent lost at each field and each fumigant over the duration of the study.

Acknowledgements

Support for this research was provided by USDA-ARS Pacific Area-Wide Pest Management Program for Integrated Methyl Bromide Alternatives, the California Department of Pesticide Regulations, the Almond Board of California, and the California Strawberry Commission. Fumigation services and tarp were provided by TriCal, Inc. and Raven Industries.

Table 1: Specifications for Each Treatment Plot

Field #	Fumigant Product[x]	Field size (acres)	Soil Sealing Method[y]	Tarp cutting time
1	Pic-Clor 60	8	VaporSafe TIF	When the concentration under tarp is <5% of the initial concentration or on day 15
2	Pic-Clor 60	2	VaporSafe TIF	When the concentration under tarp is <15% of the initial concentration or on day 10
3	Pic-Clor 60	2	VaporSafe TIF	When the concentration under tarp is <25% of the initial concentration or on day 5
4	Pic-Clor 60	2	VaporSafe TIF + KTS [y]	When the concentration under tarp is <25% of the initial concentration or on day 5