Preplant Session 1: EPA Determination of Soil Fumigant Emission Reduction Factors

Jeffrey L. Dawson, US EPA/Office of Pesticide Programs, Health Effects Division, 703-305-7329, Dawson.Jeff@EPA.Gov

Goal: The U.S. EPA is currently evaluating the potential risks associated with the pre-plant uses of a variety of soil fumigant chemicals. In its effort to develop risk management decisions for these materials, it has become increasingly clear that quantitative data of sufficient quality would allow for a more rigorous determination of how basic factors such as soil moisture, soil temperature, mulch types, or the percent of organic matter influence emissions at the field level. Given the regulatory challenges that exist, the development of emission reduction factors which better reflect modern cultural practices and conditions are required. It is envisioned that these factors can be used to potentially alleviate the regulatory burdens for users who utilize such approaches as part of their practices. Examples of such factors may include: (1) emission reduction based on high barrier film use; (2) influence of soil moisture levels; and (3) influence of organic matter on emissions. The goal of this session is to begin to summarize available research on this issue, use this research to identify the critical factors that should be considered related to emissions reduction, and to begin to define factors for these parameters.

Questions:

1. Individual factors that impact fumigant emissions from treated fields such as soil characterization, depth/type of delivery system, moisture levels, soil temperature, and soil surface laminar air flows can be generally referred to as first-principles factors. What are the most important first-principles factors which impact emissions from treated fields? Are they independent or do they impact emission rates in a synergistic manner? How much impact do regional and cultural practice differences have on these results?
2. Can first-principles parameters be manipulated by producers, in a typical commercial production system, to reduce emissions yet still retain an effective, economically viable production system? If so, what techniques can be used to manipulate field conditions (e.g., high barrier films, irrigation, soil adjuvants)?
3. Do data exist that can be used to demonstrate, in a reliable manner, responses to questions 1 and 2?
4. Modeling approaches have been suggested as a means for using laboratory, micro-field, and field-scale data for predicting emissions under varied field conditions based on changes in first-principle parameters. One such suggested system is Chain 2D that was developed by USDA (http://www.ars.usda.gov/Services/docs.htm?docid=8914). What data are required for the reliable use of such models? Do other viable model options exist that can be used to predict emission rates based on first-principles parameters?

The intent of this session is to provide a public forum where research and initiatives related to the above goal and questions are presented. EPA is not asking participants for recommendations to make regulatory decisions.