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Dow AgroSciences

US Environmental Protection Agency
Scientific Advisory Panel
EPA East Building, Room 4207
1201 Constitution Avenue, N.W.
Washington, DC 20004

Attention: Joseph Bailey, Designated Federal Official

Dow AgroSciences submits the enclosed documents in support of the USEPA-FIFRA Science Advisory Panel review of the Soil Fumigant Exposure Assessment Model (SOFEA©) scheduled for September 9 and 10, 2004.

SOFEA, a stochastic numerical modeling tool, was developed by Dow AgroSciences as a regulatory tool to evaluate and manage human inhalation exposure potential associated with the use of soil fumigants. SOFEA calculates fumigant concentrations in air arising from volatility losses from treated fields for entire agricultural regions using multiple transient source terms (treated fields), GIS information, agronomic specific variables, user specified buffer zones and field re-entry intervals. A modified version of the USEPA Industrial Source Complex Short Term model (ISCST3) is used for air dispersion calculations. SOFEA uses field observed (or numerically generated) fumigant flux profiles from soil as transient source terms for both shank injection and drip-irrigation applications. Reference flux observations are scaled based upon depth of incorporation and the time of year to map the complete flux response surface from field/numerical observations. Weather information, field size, application date, application rate, application type, depth, pesticide degradation rates in air, tarp presence, ag-capable land, field retreatment, buffer setbacks, and other sensitive parameters are varied stochastically using Monte Carlo techniques to mimic region and crop specific agronomic practices. Agricultural regions up to 19,000 mi^2 can be simulated for temporal periods ranging from 1 day to more than 70 years for the purpose of assessing acute, sub-chronic, or chronic risk. Multi-year simulations are conducted using random field placement in all agricultural capable areas as well by selectively placing fields in historical or prospective use areas. Regional land cover, elevation, and population information can be used to refine source placement (treated fields), dispersion calculations, and exposure assessments. Both current and anticipated/forecasted fumigant scenarios can be simulated to provide risk managers the necessary information to make sound regulatory decisions. SOFEA has been successfully used for regulatory decision making in California. Algorithms used by SOFEA to refine exposure predictions and manage acute, sub-chronic, and chronic risk associated with the use of soil fumigants on a local or regional basis are presented.

Contents of Submission

- **SOFEA_ver1.xls**
  - Contents: The SOFEA model with sample data and related weather directories etc.
- Folder entitled "**Bin**"
  - Contains files and executables necessary to run SOFEA.
- Folder entitled "**Weather**"
  - Contains sample MET files necessary to run SOFEA.
- Folder entitled "**SAP Documents**" which contains:
  - **SOFEA Read me File - Getting Started.pdf**
    - Brief description of sample SOFEA input file to get user started
  - **SOFEA Installation Guide.pdf**
    - Instructions for installing SOFEA on your computer
  - **SOFEA User's Guide.pdf**
    - Detailed instructions for entering input parameters and running SOFE

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- **SOFEA Programmer's Guide.pdf**
  - Documentation of the VBA code and other executables used in SOFEA
- **Predicting Soil Fumigant Acute, Sub-chronic, and Chronic Air Concentrations Under Diverse Agronomic Practices.pdf**
  - SOFEA background document
- **Predicting Regional Emissions and Near-Field Air Concentrations of Soil Fumigants Using Modest Numerical Algorithms.pdf**
  - Cryer et al. 2003. Journal of Agricultural and Food Chemistry
- **Predicting 1,3-D Air Concentrations Resulting from Tree and Vine Applications in California.pdf**
  - Cryer and van Wesenbeeck. 2001. Journal of Environmental Quality

If you require further information, please contact me at (317) 337-3376.

Sincerely,

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BAH/akh
Enclosures
cc: Jeff Dawson (7509C) cover letter