PPDC Meeting

Update on Field Volatilization of Agricultural Pesticides

U.S. EPA

October 8, 2008

Volatilization

- What is it?
  - Vapors of a pesticide leaving a treated area
- Why should we be concerned?
  - Want to ensure that we are accounting for exposures through the inhalation route in or near a field that has been treated with a pesticide

Field Volatilization Update

- New EPA website: Pesticide Issues in the Works
  - Discusses what EPA is currently doing regarding field volatilization
  - **http://www.epa.gov/pesticides/about/intheworks/volatilization.htm**
- December 2009 SAP scheduled
  - Plan to take many science issues related to pesticide volatilization to the SAP, including: toxicological, exposure, and assessment issues

Field Volatilization Update

- PANNA has produced a number of Drift Catcher Reports from sites across the USA over the last few years
- Newest PANNA Drift Catcher Report (released Sept. 2008)
  - Repeat of study done in Hastings, FL released in April 2007
    - 2007 study collected 8 samples from December 6-14, 2006 and found diazinon, endosulfan and trifluralin
    - 2008 study collected 39 samples from October 1 thru December 6, 2007 and found chlorothalonil, diazinon, endosulfan and trifluralin

Field Volatilization Update

Maximum and Average 24 Hour Air Concentrations from PANNA Hastings, FL Drift Catcher Reports(ng/m^3)				
	2007 Report		2008 Report	
	Max	Average	Max	Average
Chlorothalonil	Not found		555	107
Diazinon	897	311	575	42
Endosulfan	626	278	1,376	248
Trifluralin	376	84	136	29

Example Endosulfan Assessment

PANNA	EPA
Start with the same toxicological endpoint of 0.2 mg/kg/day from a 21-day rat inhalation study	
10x UF for intra-species, inter-species, and 10x FQPA safety factor for child	Utilize RfC Methodology so 10x UF for intra-species and 3x UF for interspecies; FQPA safety factor removed
Target Concentration = 7,800 ng/m^3 for adult 339 ng/m^3 for one year child	Target Concentration = 15,400 ng/m^3 for all populations
Compare max value of 1,376 ng/m^3	Compare average exposure of 248 ng/m^3

Example Endosulfan Assessment

PANNA

- Approach used is similar to that used by OPP in the past and is consistent with California
- Comparing max air concentration values to target concentrations assumes acute exposure
  - using a 21-day tox study as with endosulfan is a very conservative approach

HED

- RfC methodology takes into account anatomical, physiological, and kinetic differences between test animals and humans
- Compares average air concentration values to the duration of the toxicological study

Example Endosulfan Assessment

Both Methods

- Using 24 hour air concentrations is conservative assumption that may overestimate exposure
  - Not likely an individual would be stationary for entire 24 hour period
- Data doesn't take into account differences in indoor vs. outdoor concentrations
- Data may be reflecting both drift and volatilization after applications